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EDITORIAL CONTENTS

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Feature Articles

Truck Driver Lingo 18
Radio Regulations Arm Wave the Trucking Industry on Air Waves 22
Pot Shots at Poppet Valves 23
2-Cycle Principles 24
Sheep Skins for Shop Men 26
Vapor Lock 29

Descriptions

GM's 2-Cycle Diesels 32
GMC Trailer Body 34
New Buda Diesels 34
Heavy-Duty Walter 34
Hercules Crete-Mobile 34
Knock-Down Body by Highland 36

Departments

The Overload 17
Ears to the Ground 19
Shop Hints from Fleet Shops 20
After Hours 28
The Album 30
New Truck Registrations 36
New Products 38
News Summary 42
Free Money Savers for You 77
Advertisers' Index 94

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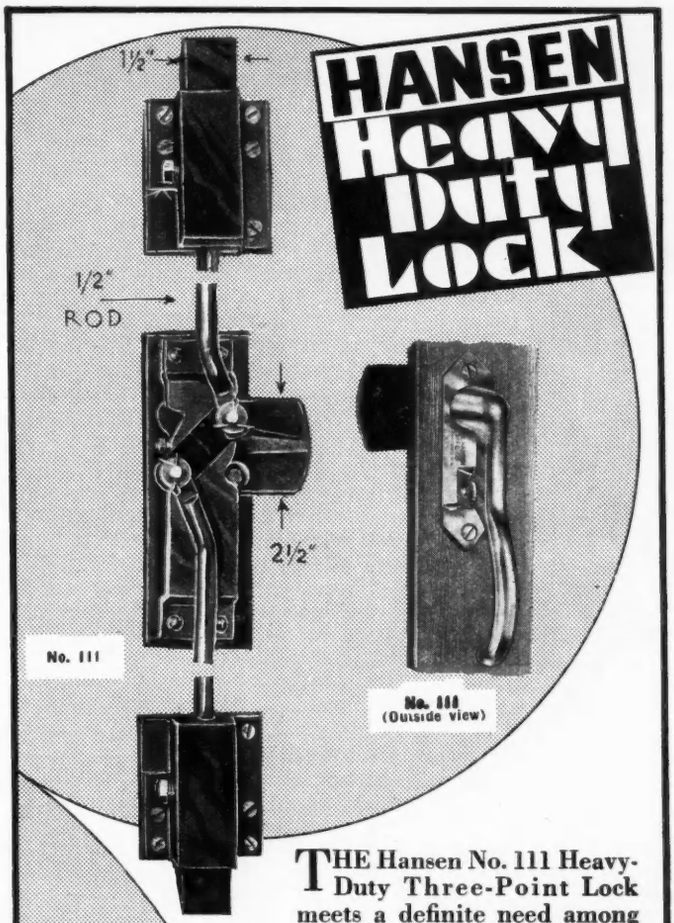

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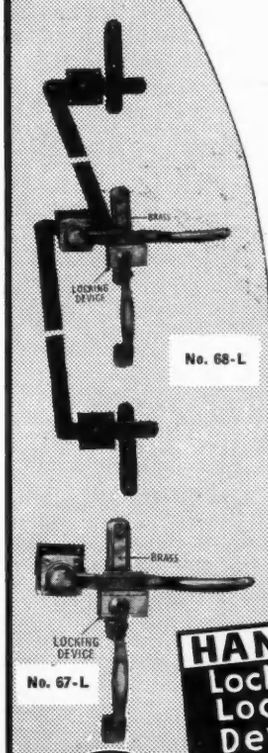

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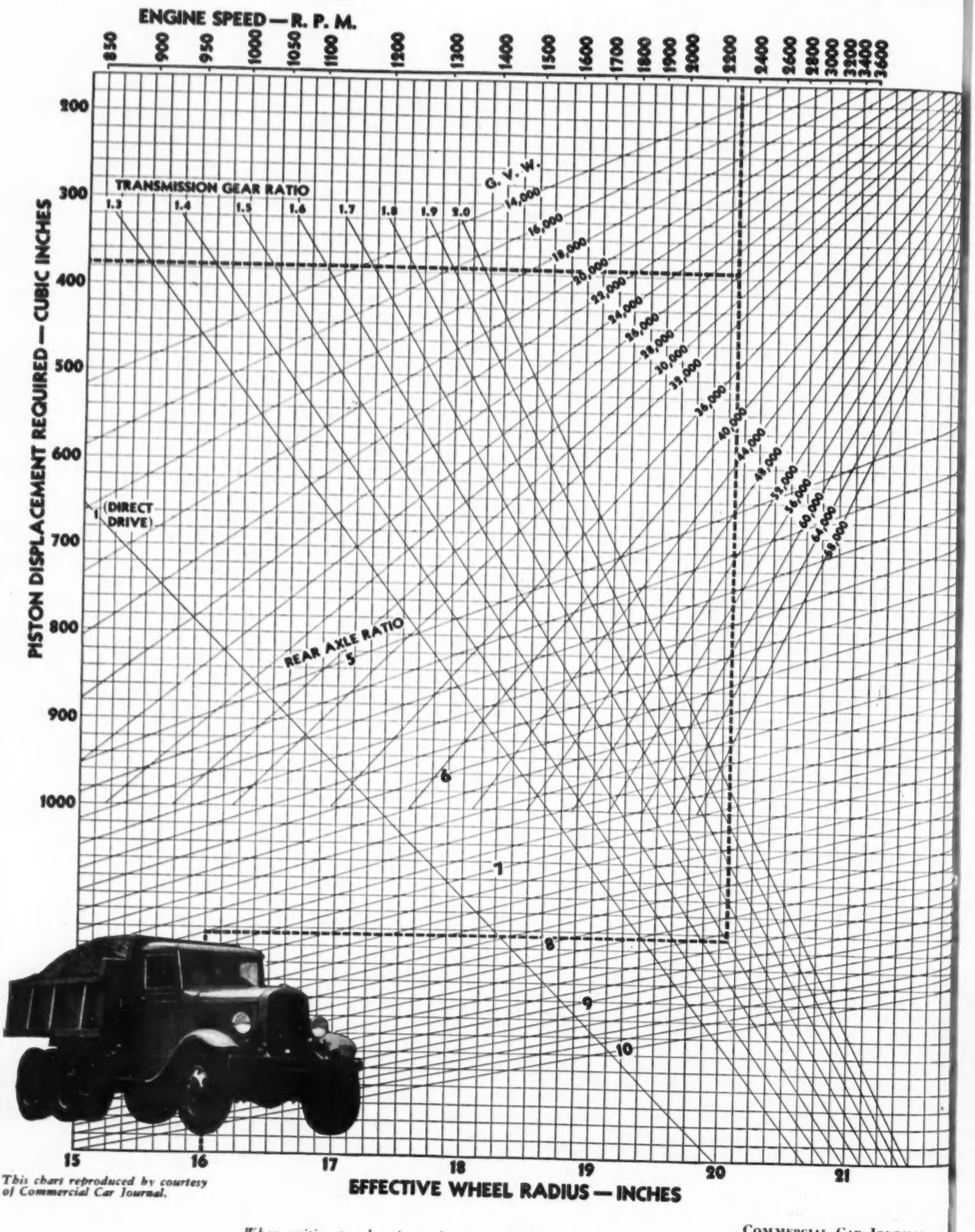


This chart reproduced by courtesy of Commercial Car Journal.

COMMERCIAL CAR JOURNAL
VOL. LV, NO. 1 MARCH, 1938

THE OVER LOAD

Proof That . . .

Generally this department leads off with a preview of the issue. This month is no exception. We are prepared to render an accounting with an itemized statement. Speaking of accounting reminds us that not until proof sheets were in front of us did we realize how much research—representing what fleet operators speak of as "hidden costs"—went into the making of this issue.

. . . Research . . .

A heap of research work went into such articles as those on valve troubles, vapor-locking, two-cycle diesel principles, radio communication, and schools for mechanics. They represent a "heap o' larnin" and we recommend them as extremely informative articles, simply but interestingly composed. Readers will find them helpful in a definitely practical sort of way.

. . . Takes Time . . .

The article on valves has been on its way to you for all of one year. The easiest part of the job was finding the right man to do it. But the author, whom you will recognize when you see his by-line on the article, is a very busy man. He fell in readily with our idea and thereby inherited the hardest part of the job: digging up the material and finding the time to put it into words. He did a magnificent job, giving us much more than we could use in one article. That's why you are getting it in two loads. In this issue we give you a resume of valve service problems, their causes and cures. Later on, perhaps in June, we'll deliver the other load which will sketch the inside story of valve design in such a way as to give fleetmen a splendid background on engine maintenance.

. . . Falls Short . . .

We've tried to do a comprehensive job on schools for mechanics. Something tells us—and the something is experience—that we may not be as comprehensive as we think. Therefore, this is an open invitation to manufacturers who conduct schools and whom we have unintentionally slighted, to join the ranks of the publicized. It took six months to collect the data for this article. Why? We can't tell you now; but it did.

. . . Plays Long Shots . . .

Some readers may think we went pretty far afield on the radio article. They may argue: Who in the truck industry cares about the possibilities of two-way short-wave radio telephony? Some, of course, do care. But whether they care or not, we feel it our duty to overlook no possibilities for improving the efficiency of motor truck usage. That's why we looked into the possibilities of radio in trucking, and what we found out takes this matter, for the first

(CONTINUED ON NEXT PAGE)

Tony, the peanut man, must eye with envy the handsome store-on-wheels, or more accurately the store on a 130-in. c.o.e. International, which plies the streets of South Gate, Cal. In addition to carrying all sorts of ice creams and pasteries, the unit boasts a built-in refrigerator and soda fountain and two detachable push carts with display cases for house-door delivery

CCJ QUIZ

THE old game of "ask me another" has taken a new lease on life. Over the radio and in print it is being played with renewed interest. The difference is in the name—today it is called a "Quiz," and in the way the questions are asked—today they are more entertaining. There's no reason why we shouldn't play the game, too, with questions that pertain to our own industry. In fact, we invite you to play the game right now. Here are 10 questions. Read each one and check the answer you believe to be the correct one. When you have finished, compare your answers with the correct ones given on page 67. In scoring, give yourself 10 points for each question answered correctly. On this quiz a total score of 70 is good. Can you better it?

1. Interstate Commerce Commission safety regulations stipulate that front clearance lights on new trucks should be:

red *white* *blue*
green *amber* *purple*

2. If a thug stuck a gat in your ribs and offered to spare you if you'd give him the generic name of Prestone, you'd swallow twice and say:

dichlorimethane *ethylene glycol*
sodium chloride *tetraethyl-lead*

3. One of these is the new chairman of the board of Reo:

James A. Farley *Rowland Campbell*
R. E. Olds *James V. E. Johnson*

4. The most recent mechanical innovation in motor trucks is:

hardened valve seat inserts
independent wheel springing
radio range finder
hydraulic valve lifters

5. The first company publicly to announce a standard production diesel-engined truck model in the United States was:

Kenworth *Dodge* *Diamond-T*
Sterling *Hug* *Hendrickson*

(CONTINUED ON NEXT PAGE)

CCJ QUIZ—continued

6. In a recent contest one of these was chosen the "Nation's Best Truck Driver":

Joseph B. Eastman *Buddy Horton*
W. J. Frederick *Ted V. Rodgers*
Joe Burke *Ab Jenkins*

7. If the little woman stopped the bridge game to say, "Dear, what is 1 horsepower?" you'd reach for the scotch and mumble:

the power required to move one horse 1 ft. in 1 minute
the power needed to move 1 pound, 33,000 ft. in 1 minute
the power a horse uses moving 1 pound, 1 ft. in 1 minute

8. If you were a government inspector and you stopped a truck on the highway to find out how many miles it had traveled, you'd look at:

the speedometer *the chronometer*
the odometer *the tachometer*
last week's driver report

9. If the boss painter wanted a transfer design he'd ask the purchasing agent to order a:

kleptomania *hypochondria*
polychrome *dipsomania*
decalcomania *chromosome*

10. The initials used to designate the national organization of motor truck operators are:

N.O.O.M.T.O. *A.M.A.* *C.C.C.*
N.H.U.C. *A.T.A.* *A.M.T.A.*

Correct Answers on Page 67

The Overload—continued

time, out of the field of the purely speculative.

. . . But You Win . . .

Our purpose in running the article on two-cycle engine principles was to relieve you of the trouble of looking up textbooks. We did the looking up for you. We also did some looking up in the case of vapor-lock. What we give you is in the nature of the key to this troublesome matter.

. . . Every Time . . .

Shop-Hint sender-inners continue to collect five-dollar bills. This is a reminder to shopmen that our supply of these bills is practically inexhaustible. That goes for our supply of two-bit pieces for lingo-slingers. On this page you'll see the lingo that's been slung at us so far. What are your pet words?

. . . Even Next Month!

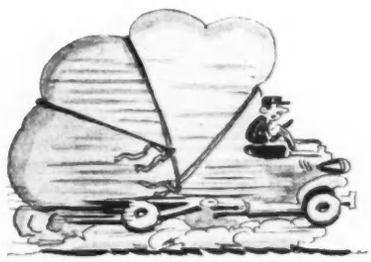
Next month look for the big 1938 Fleet Operators' Reference Annual.

TRUCK DRIVER LINGO

A Glossary of Quaint Terms Used by Spinners

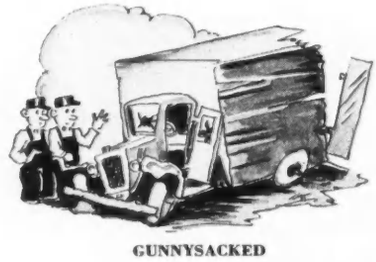
Editor's Note: This is the first time a vocabulary of this sort has been compiled. It is by no means complete. To make it so, 25 cents will be paid for each new word and definition that is accepted.

ARMSTRONG STARTER—the crank handle
BALLOON FREIGHT—light, bulky merchandise
BARRELING—running with throttle wide open
BEEN AROUND THE HORN—truck with high mileage on speedometer
BELLY UP—a truck over on side or on its back



BALLOON FREIGHT

BICYCLE TIRES—undersized tires
BIG HOLE—low gear
BOSS HER—backing tractor into position
BROKE TO LEAD—a truck that needs to be towed in
BUG JUICE—gasoline
CANDY WAGON—a light truck
COG STRIPPER—driver who makes noise when shifting gears
COMMENCER—electric starter
COMPANY NOTCH—same as Big Hole
COP CALLER—truck with squeaking brakes
CREEPER—same as Big Hole
EMERJENSON—emergency brake
FAIRWEATHER TRUCK—engine that will die out or skip during rain or snow storm
FLOORBOARDING—same as Barreling
FOLLOW HER AROUND—same as Boss Her
FOOT IN THE CARBURETOR—reference to a speeding driver
GEAR FIGHTER—same as Cog Stripper
GET OUT THE BOOK—driver making error by stalling, etc.
GOOSE IT—feed gas in irregular spurts
GOT MARBLES IN THE OIL—noisy engine
GRANDMA HOLE—same as Big Hole
GROWLER—same as Big Hole
GUNNYSACKED—a badly abused truck
JOHNSON BAR—emergency brake lever
KIDNEY BUSTER—hard-riding truck
KILLER—a truck with no brakes
LIFTEN BEDS—dump bodies



GUNNYSACKED

TWIST HER TAIL

of Cop Callers, Kidney Busters and the Like

LOAD OF STICKS—a truck and trailer load of big logs
MIXING THEM UP—engine with preignition
NO ANCHORS—same as Killer
No. 1—same as Big Hole
ON THE BUTTON—crankcase oil up to level

KIDNEY BUSTER

ON THE BUTTON—truck going full speed
OUGHT HOLE—same as Big Hole
PEANUT ROASTER—air leak in intake manifold
PENSION RUN—a short, easy, regular haul
PICKER UPPER—service car with crane
PRIDE OF THE FLEET—an old rattle trap truck that's hard to handle
RIDER—a flat on duals that carries no load
RIDING A FIREBUG—one rear tire on dual wheels flat causing fire hazard
RUBBER BANDS—same as Bicycle Tires
SHAKING DOWN THE ASHES—cranking a truck
SHOTGUN HERDER—an inexperienced driver
SKIN—tire casing
SNUB SNOOT—cab-over-engine truck
SOFT COAL BURNER—diesel-powered truck
SOLD OUT TO THE YANKEES—a southern driver who has cracked up his truck
SOLID OF WIND—an empty trailer
SPOOK—insurance or safety spotter
SPOOK REPORT—a spotter's report
SUPREME LOW—same as Big Hole
SWEAT SHOP—bullet-proof cab with little ventilation
SWEETHEART—a good performing piece of equipment
THROW OUT THE ANCHOR—use emergency brake
TISSUE PAPER—truck frames that bend or break easily
TOTE WAGON—light truck used to haul supplies in a construction camp
TRAINING TO BE AN ESKIMO—applied to driver who persists in riding with window open in cold weather
TRUCK SPINNER—a driver
TWIST HER TAIL—same as Shaking Down the Ashes
WIND HER UP—start the motor
WORKING FOR STANDARD OIL—truck using excessive gasoline
YODELING GEAR—an overdrive that makes a high singing noise
&'(*)"#$#*—street car motorman

SOLD OUT TO THE YANKEES

Steam Starter

This department has a transom and it is kept open. This month we were rewarded by having some information come in via the ventilator. Chucked over the top was a note that says that a steam engine for trucks will shortly be announced. It develops 200 hp., burns pulverized bituminous or lignite coal or oil or any combination of these two. It can be operated from cold in two minutes. The generators operate at 750 lb. and are non-explosive. The unit requires, of course, no clutch or transmission.

Better Bearings

Our agent in charge of interpreting things that metallurgists say in terms of one syllable words that editors can understand reports that he has heard the details of a process that makes it possible to combine indium with such bearing materials as cadmium and lead. Indium as a metal has been around for a long time but no one seemed to have any use for it until now. Bearings alloyed with this museum metal will resist corrosion from crankcase mixtures and thus the bearings will last much longer.

Brake Baffler

Some new brake truing equipment is about ready for announcement. Sad to relate our operative writes us enthusiastically but neglects to give us any details which puts him in the doghouse for the time being.

Fuel Facts

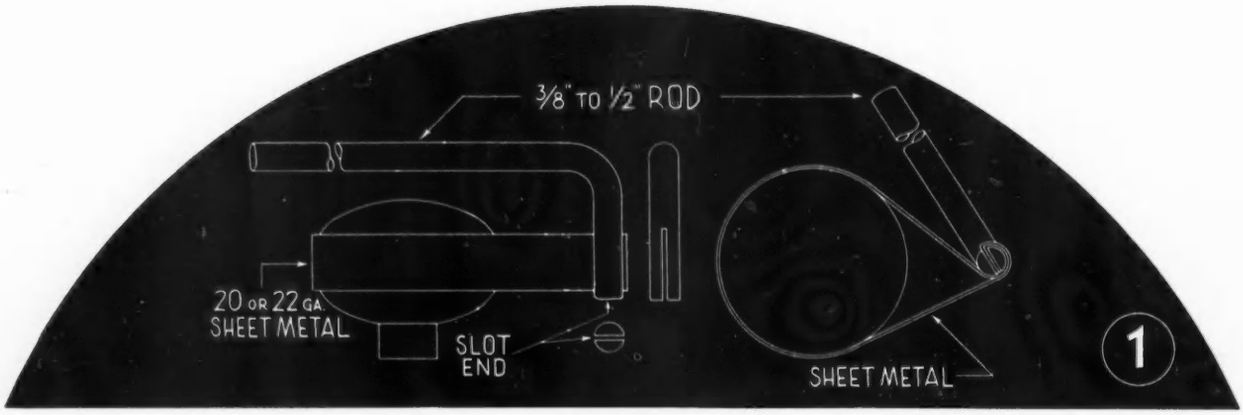
In time for the vapor lock season a new electric fuel pump will find its way to market. About the unit itself even this department's efficient espionage organization has failed. However it is known that the pump can be mounted anywhere between supply tank and engine.

Brake Ballast

A new hand brake operating in the immediate vicinity of the transmission is claiming some remarkable things about itself. Among them long life and the same for the drive line.

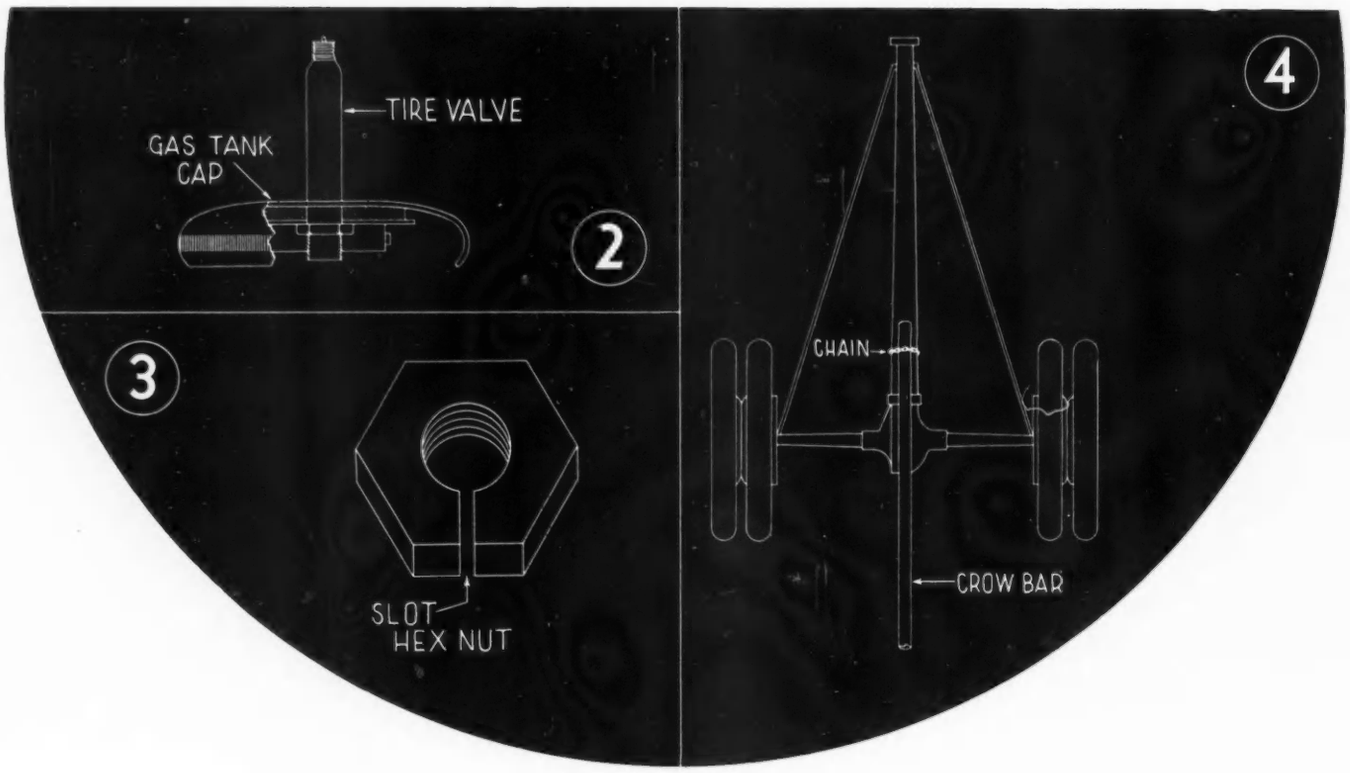
Vacuum Vote

This department has been listening to a gentleman who claims that with a few simple changes any engine can be made to incorporate a vacuum pump so that it would not be necessary to attach a separate pump or depend upon varying manifold conditions. Being a function of original design, engines cannot be modified after they are built—that is, not for a price you would pay.

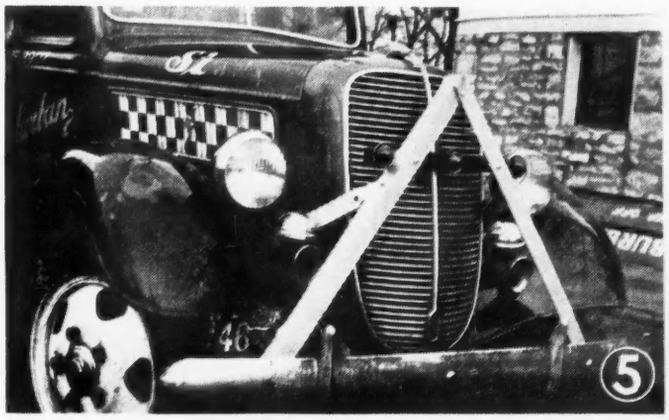


Five Dollars

Will be Paid by CCJ for Each Hint



SHOP HINTS *from* FLEET SHOPS



Accepted. Ideas Count — No Matter How Rough. We Will Polish Them Up

1. Wrap-around Wrench

By Fred Johnick

Keystone Steel and Wire Co., Peoria, Ill.

To remove a shift lever knob, round nut or any round object where it is not desirable to use a Stilson wrench, a wrench can be made in the shop. Take a piece of ½ in. or ⅜ in. rod and bend one end of it to a right angle. Cut a slot in the end that has been bent and cut a strip of 20 or 22 gage sheet metal. Place the sheet metal around the object to be removed and enter both ends of the sheet metal through the slot. Cut the sheet metal long enough so that it will wrap around the wrench several times before it begins removal of the object.

3. Stud Holder

Once in a while it becomes necessary to hold the threaded end of a stud or bolt in a vise without damaging the thread. It can be done by simply taking a nut of the same size and thread as the bolt or stud and cut a slot in it with a hacksaw. Then put the nut on the threads and tighten the vise. The nut will hold the bolt or stud and none of the threads will be injured.

2. Fuel Pressure

By George Goldfus

Mohn and Hunter Laundry, Buffalo, N. Y.

I always carry a spare gas tank cap which will upon application convert a fuel system into a pressure system. The cap has had the vent hole plugged with a drop of solder and in the center a hole has been drilled and a tire valve inserted and soldered in place. If the fuel pump fails the cap can be put on the tank and an ordinary tire pump will bring the pressure up to four or five lb. which will get the truck home from any reasonable distance.

4. Torque Tube Assembly

By Howard E. Wood

Little Valley, N. Y.

When the rear assembly has been removed on a torque tube drive the man replacing the unit has to hold up all of the weight of the tube and at the same time enter the splines of the drive shaft in the universal joint.

If a light chain is thrown around the torque tube just ahead of the differential and a 6 or 8 ft. bar inserted in the loop, a second man bearing down on the bar using the axle housing as a fulcrum can shift the axle up or down, left or right leaving the man under the truck free to enter the splines. Once the splines are entered the man under the truck calls for a little forward pressure and the shaft is engaged.

5. Radiator Guard

By Si Jansma

Suburban Coal and Hauling Co., Webster Groves, Mo.

Since the price of radiators, radiator shells and grilles increases every year and our trucks have suffered considerable damage to these parts in slippery weather we decided to equip each of our trucks with a guard. The guard is made of 2 in. by ¼ in. angle iron in pyramid shape fastened to the bumper bolts. A piece of 2 in. by ½ in. iron runs from the guard through the fender and is bolted securely to the truck frame. The guard is simple to make and easy to install and we have had occasion during the past winter to find that it will take a very hard rap and the cost is extremely low.

Drive Shaft Short Cut

By A. M. Densmore

Densmore Transfer Co., Inc., Birmingham, Ala.

To avoid pulling the rear axle on any short wheelbase Chevrolet truck having two universal joints, when relining the clutch or removing the transmission, replacing universal joints or any operation that calls for the drive shaft to be removed: take bolts out of bell housing and loosen bolts that hold bracket on rear universal joint. Take load off the rear springs by jacking up the chassis at the rear, then take out spring bolts on the rear springs and roll the wheels back the length of the rear shackle. The drive shaft will then slip out. This saves the trouble of disconnecting hydraulic brake lines and bleeding brakes as well as removing balance of rear axle.

RADIO REGULATIONS ARM WAVE THE TRUCKING INDUSTRY ON

AIR WAVES

Federal Communications Commission Wigwags a Stop Sign at Fleet Men Who Wonder If Radio Holds Possibilities for Over-the-Road Trucking

RADIO—the modern miracle—has proved its usefulness in so many ways, that it seems natural fleet operators should wonder if perhaps it might have benefits for them. This curiosity revealed itself in inquiries to COMMERCIAL CAR JOURNAL, and inspired a study of the problem, the results of which are here presented.

The outlook at the moment is, frankly, not very encouraging.

Specifically, the problem relates to the possibilities of mobile radio equipment for use in trucks and passenger cars which would serve as a communication link between vehicles in the field and one or more fixed stations at home or branch offices. Such possibilities would include radio installations in emergency fleets, fire vehicles and public utilities, as well as for purely commercial uses such as to keep over-the-road vehicles in touch with their home offices. Many are aware of the developments in the last few years that now make such installations technically possible but not all understand the problems that stand in the way of making them commercially practical.

Biggest of these problems is the securing of suitable air-wave channels, and solely responsible for the allotment and enforcement of the air ways is the Federal Communications Commission.

One important fact and one important motive guide the Commis-

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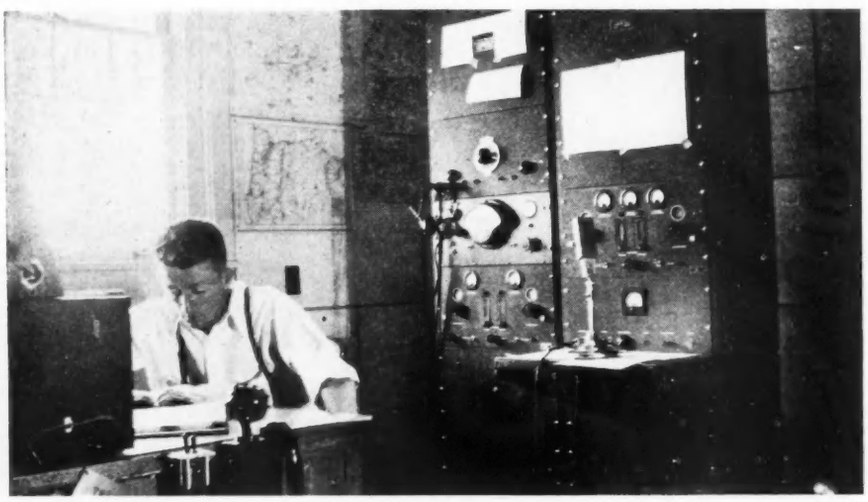
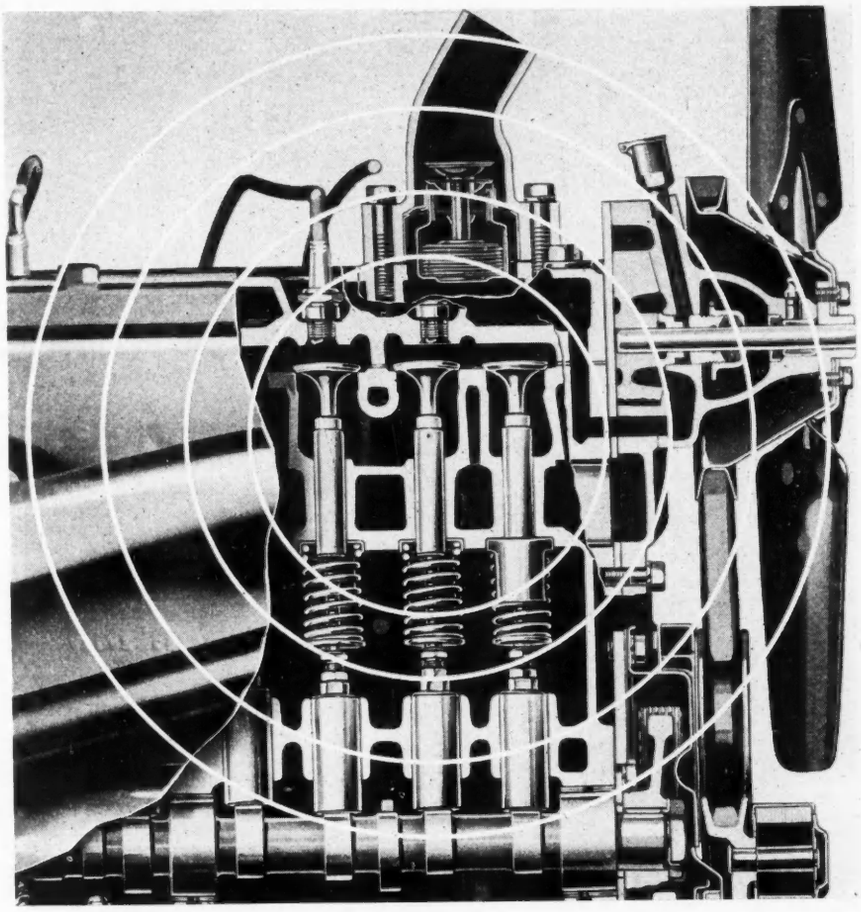


By

C. B. Rawson

Left: a base station used by the State of Oregon for control of its emergency fleet



POT SHOTS AT POPPET

VALVES

Bull's - eye Hits of Common Valve Troubles and Service Hints by an Expert Marksman

By V. C. Young

Chief Engineer, Wilcox-Rich, Division of Eaton Manufacturing Co.

THE demands imposed upon valves in modern engines have been increasing so that the design of this particular engine part has become one of vital importance. In the early years some details were more or less neglected but with increased power and speed the exhaust valve has been called upon to withstand stresses far in excess of other parts of the engine.

Some of the major factors that must be considered in meeting these demands are:

1. The material must have good strength under high temperature conditions of operation in order for the valve to hold its shape and not stretch or break.

2. It should be able to resist corrosion at operating temperatures including the so-called cold corrosion as well as that which occurs in the red temperature zones.

3. The transformation or critical temperature should be well above the operating range in order to reduce distortion to a minimum.

4. It must have good wear resisting qualities at the seat, in the stem proper to resist guide wear and on the foot.

5. It should be able to withstand the frequent changes in temperature without any permanent change or loss of its original physical properties.

The basic problem in all operation is to keep the temperatures to a minimum. The problem of cooling is a major problem and anything that can be done to increase the cooling effect so far as the valve is concerned will be of material benefit. Wherever possible the designer provides the maximum amount of cooling which,

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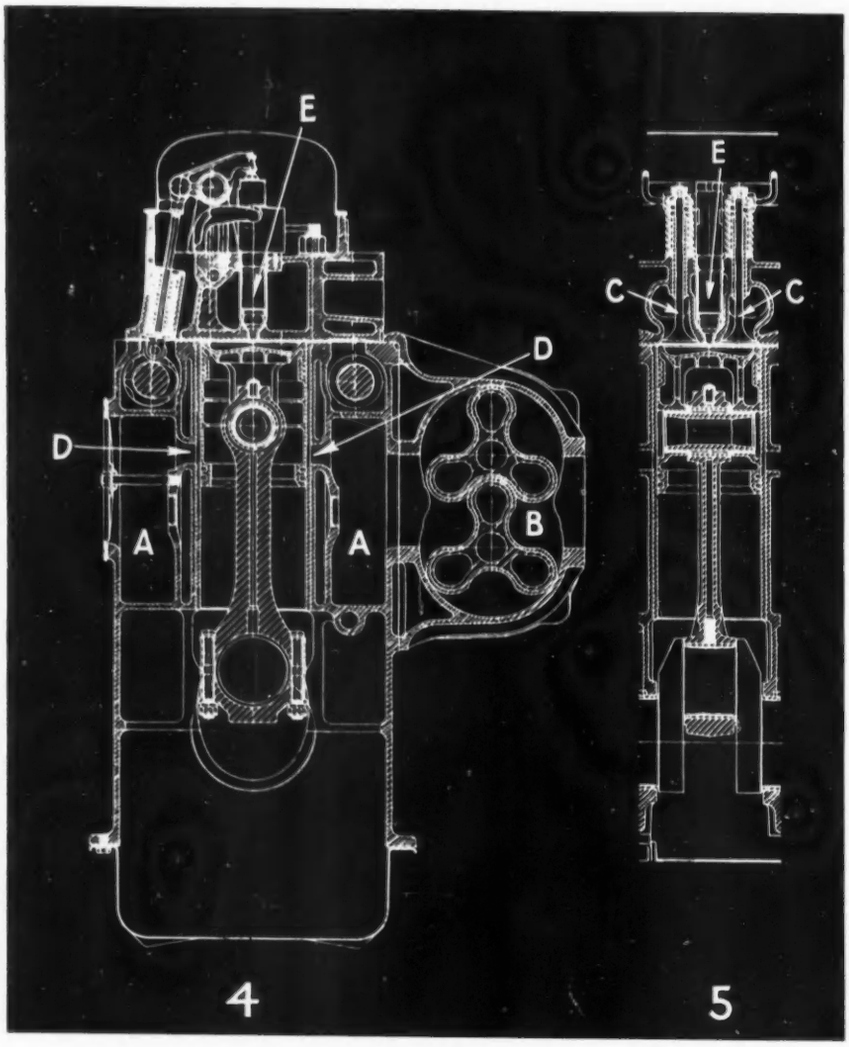


Above: Modern version of the 2-cycle principle as utilized in the diesel engine series just announced by General Motors. On the opposite page is the older gasoline type. See text of story for explanation of both types

THE two-cycle engine will come back in 1938 as an automotive powerplant in American vehicles after an absence of 25 years. The two-cycle engine left as a carbureted gasoline passenger car powerplant and returns to the industry as a truck engine using solid injected furnace oil as fuel.

The reason for developing and producing a two-cycle diesel engine is to reduce the weight. The diesel engine has very definite advantages, but it also has the handicap of increased weight. The operation of a diesel engine calls for high pressures and the only method of making parts strong enough to stand the increased pressures over a gasoline engine is to put more metal into the various parts than would be put into the parts of a comparable gasoline engine. It naturally follows that a four-cycle diesel engine will weigh more than a gasoline engine comparable from the standpoint of horsepower and torque. In addition it is larger and consequently will take up more space. This latter consideration is no little problem in itself in vehicle design.

Operators of large capacity trucks are the most likely users of diesel engines and in almost all cases the operators of this type of equipment are operating within or into areas where there are severe restrictions on the total weight of the vehicle and load, and also upon its length. Therefore any increase in weight of a diesel engine means simply payload that the truck cannot carry and

If You Are Hazy on Ups and Downs of 2-Cycle Operation, Here's The

2-CYCLE

PRINCIPLES

length of engine means reduction of payload space. Reduction of weight and size of the diesel engine is naturally then of great importance.

THE two-cycle makes possible the reduction of weight by the fact that every downward stroke of the piston is a power stroke instead of every other downward stroke as in a four-cycle engine. Thus if the power stroke in a two-cycle engine can be made as efficient as the power stroke in a four-cycle engine, only half as many cylinders are required for the same result. By operating on the two-stroke cycle, it is not possible to reduce the weight of the various parts but it is possible to reduce the number of them by getting the horsepower and torque from half the number of cylinders and therefore reducing the total weight and size.

Most of the old two-cycle engines admit the mixed air and gasoline from the carburetor to the crankcase through port A (Fig. 1). The piston moving upward creates a partial vacuum in the crankcase and when the piston has traveled upward sufficiently far to uncover port A the mixture enters the crankcase. During the following downward stroke of the piston, port A is covered and the piston moving downward compresses the mixture in the crankcase.

As the piston nears the bottom of the stroke it uncovers port B (Fig. 2) and since the mixture is under some compression in the crankcase it flows into the cylinder through port B. Shortly after the piston starts on its upward stroke it closes port B and therefore in the remainder of the stroke the mixture is compressed in the cylinder. When the piston reaches top center the compressed mixture is ignited and a power stroke downward results.

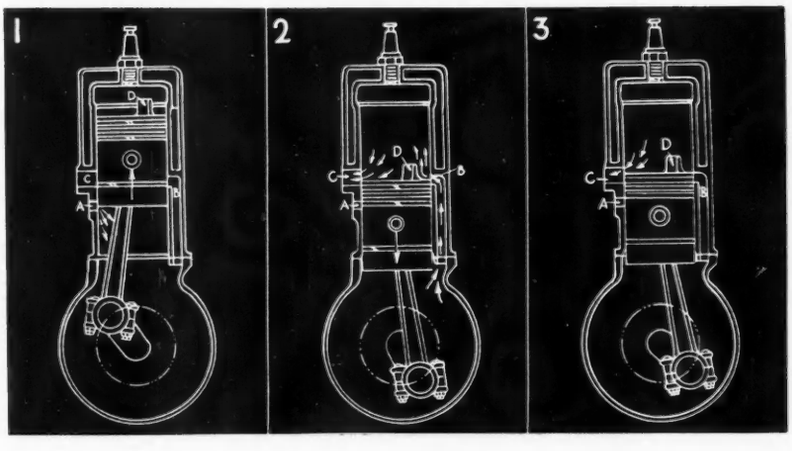
On the downward stroke the piston uncovers port C (Fig. 3) and the burned gases still under some pressure escape through this port. Port C being slightly higher in the cylinder opens slightly ahead of port B and for that reason considerable of the exhaust gas escaped before any new charge enters the cylinder through port B. The remainder of the exhaust gas is swept out by the fresh charge entering through port B. It is impossible to be sure that all of the exhaust gas has left the cylinder and that some of the fresh charge has not escaped with the exhaust gas, and herein lies the weakness of the two-cycle carbureted engine. In order to prevent mingling of the gases, however, deflector D on the piston head directs the fresh charge upward from where it tends to push the exhaust gas out. Thus the evacuation of the exhaust gas from the cylinder and the filling of the cylinder with a carbureted mixture occur simultaneously on each downward stroke, which is a power stroke, and each upward stroke is a compression stroke.

GENERAL MOTORS' new two-cycle diesel engines do not operate on a carbureted mixture and there are other variations from the above described operation. Being diesel engines the intake through the port is air and not a fuel air mixture. The chamber A (Fig. 4), which surrounds each cylinder, contains air under pressure from the Roots type supercharger B. As the piston travels downward the exhaust valves (two per cylinder C) open and the exhaust gas escapes, Fig. 5. Later on the downward stroke the piston passes and exposes ports D and the incoming air from the supercharger pushes the exhaust gas out through the exhaust valves and fills the cylinder with fresh air.

Before the piston closes ports D on the upward stroke the exhaust valves C close and the air, already somewhat compressed by the supercharger, is compressed in the cylinder. When the piston reaches top center the injector E charges the cylinder with fuel, it is fired by the compression, and the cycle is complete.

THIS re-entry of the two-cycle engine into the automotive field is an important development to fleet operators and their maintenance organizations. The two-cycle engine lends itself very well to the diesel engine where injected fuel is used. There is not likely to be a return to two-cycle gasoline engines unless some manufacturer decides to try his hand with solid injection of gasoline, in which case the two-stroke cycle has some very interesting possibilities.

Inside Picture Painted With a Few Strokes, Guaranteed Not to Bore



SHEEP SKINS FOR SHOP MEN

By Stanley Gerstin

A SHORT time ago COMMERCIAL CAR JOURNAL announced that it was going to school. Not to the little red schoolhouse where they teach the three R's, but to the school for fleets where shopmen would learn to use their H's (head and hands) correctly like the man on the flying trapeze. With the words still hot on its breath, CCJ matriculated (enrolled to you) in every known school operated by equipment manufacturers for the benefit of fleet shopmen to teach them the correct and efficient use of modern repair equipment.

With the appearance of this story we graduate simultaneously from such schools as Carter Carburetor where we learned the technique of how to be a good mixer; from Lincoln Welding where we learned that in union there is strength; from DeVilbiss where we were sprayed with a good coating of protective paint knowledge; from the 4D (Diesel) schools where Waukesha, Cummins, Buda and Hercules taught us the fine technique of eliminating interference; from the front-end schools, Weaver, Bendix and Bear where secrets of the alignment art were revealed.

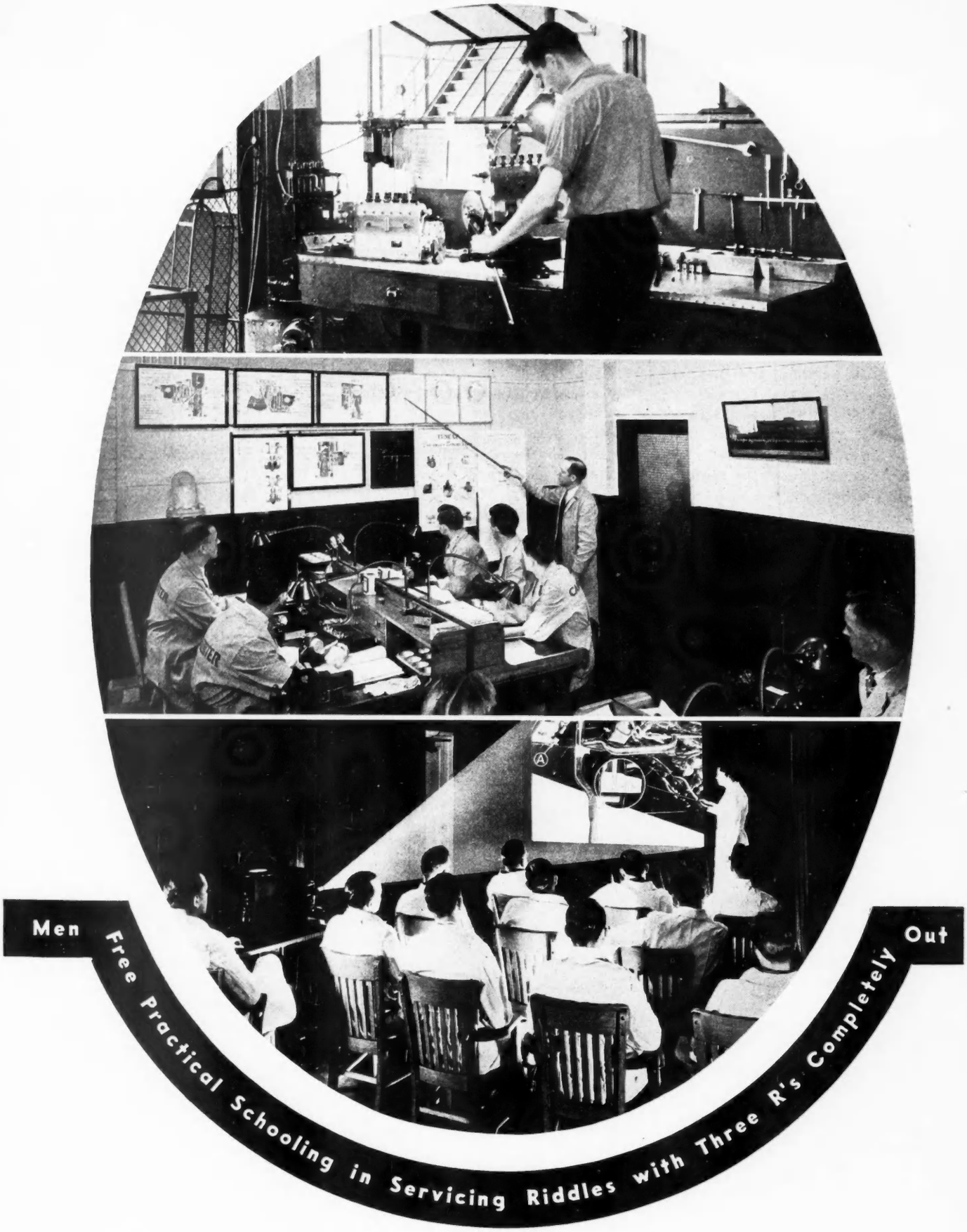
We have copious notes on what we learned, how, when, where and why, which will be passed on without charge. (The usual technique is to charge a buck a set.) At Carter, for instance, they pay you to take the cure which has to do with the proper adjustment and maintenance

(TURN TO PAGE 54, PLEASE)

Factories Offer Fleet

Speedometers are among the many subjects covered at the Auto-Lite service school (top) and when a man gets through welding at Lincoln Electric (below) he has what it takes to handle practically any welding job

In the oval a student is untangling injector problems during shop work at Waukesha, a class-room session during first week of school is in full swing at Carter Carburetor, and service men are receiving visual instruction from a Ford traveling school


Men Free Practical Schooling in Servicing Riddles with Three R's Completely Out

AFTER HOURS

EDITORIAL COMMENT BY GEORGE T. HOOK, EDITOR

The Supreme Court Points the Way for the Truck Industry

THE U. S. Supreme Court decision upholding South Carolina's 20,000-lb. gross weight and 90-in. width regulatory measures as being within the State's legislative power, was not unexpected. The measures, the Court ruled, "do not infringe the Fourteenth Amendment and the resulting burden on interstate commerce is not forbidden."

This was in line with precedent, repeatedly affirmed by the Court, that "in the absence of national legislation specially covering the subject of interstate commerce, the State may rightly prescribe uniform regulations adapted to promote safety upon its highways and the conservation of their use applicable alike to vehicles moving in interstate commerce and those of its own citizens."

YET, while the Court's decision has the unpleasant effect of sanctioning a burden on interstate trucking, its eventual effect should be very beneficial. It should spur the Interstate Commerce Commission and the truck industry to cooperate in formulating and recommending to Congress for adoption uniform and reasonable size and weight legislation within the framework of the Federal Motor Carrier Act. This remedy was pointed out by the Supreme Court in its decision. It stated:

"Congress, in the exercise of its plenary power to regulate interstate commerce, may determine whether the burdens imposed on it by State regulation, otherwise permissible, are too great, and may, by legislation designed to secure uniformity or in other respects to protect the national interest in the commerce, curtail to some extent the State's regulatory power."

Congressional authorization for such a course is contained in Section 225 of the Federal Motor Carrier Act. It states:

"The Commission (I.C.C.) is hereby authorized to investigate and report on the need for the Federal regulation of the sizes and weight of motor vehicles and combinations of motor vehicles. . . ."

THAT need, long recognized because of the lack of uniformity among all States and the downright unreasonableness of restrictions in a few States, was really intensified by the judicial blessing given to the South Carolina legislature's restrictive regulations. Few readers realize fully how great that need is. They will when they know that the far-reaching effect of the South Carolina case has been the creation of a barrier to commerce between the North and the South. The barrier is created by the 20,000-lb. and 90-in. width restriction of South Carolina and the 18,000-lb. restriction of Tennessee. The barrier extends from the Atlantic Coast to the Mississippi River with the exception of a small sector about 75 miles wide where North Carolina intervenes to separate the offending States. This sector, we understand, is a barrier in itself. In Court proceedings it was testified that it was a very mountainous section. A topographical map shows the Smoky Mountains on one side and Blue Ridge Mountains on the other. It was testified that there is only one road through this gap, "a narrow road, full of short curves and mountain climbs which make it a very hazardous highway for trucks of any size to travel."

This barrier imposes penalties that are unreasonable and unwarrantedly burdensome to carriers operating within the barrier States. To interstate carriers, whose long distance operatings make large loads and fast schedules an economic necessity, the penalties are absolutely intolerable.

A MOVEMENT to do something about this grave matter has been initiated. In November the Interstate Commerce Commission issued an order authorizing an investigation of sizes and weights. More than three months have elapsed, no hearings have yet been called and no one will be surprised at the growing impatience of the truck industry.

However, the Commission has not been inactive. A study, supervised by the U. S. Bureau of Public Roads, is now under way into the behavior of motor trucks on the highways. Also there has been completed an outline of possible research which has been presented to Division 5 of the I.C.C. for approval.

SINCE it is a subject that requires an enormous amount of research, at least a year will elapse before the Commission comes up with specific recommendations to Congress. One of the first tasks will be to procure official statements from all of the States in the Union giving factual justification for the regulations that are now in effect. There is no doubt that this will consume much time.

It is not likely that hearings, in which the truck industry can participate, will be called before July 1. This is due partly to the preliminary research that is necessary and to budgetary inflexibility. The next fiscal year begins July 1.

As soon as the outline of research approved by the Commission becomes known, every national organization in the truck industry—the Automobile Manufacturers Association, the Society of Automotive Engineers, the American Trucking Associations, Inc., and the National Highway Users Conference—should prepare itself for a combat that is of vital importance to the industry. In fact, someone should immediately take the initiative to call representatives of these national organizations together to map out a plan of action, allocating to each the procurement of necessary data.

This matter must be effectively handled. Upon the sort of cooperation the industry itself gives the Commission may well depend the cause of uniform legislation.

VAPOR LOCK

Still Stops Trucks but Here's a Key to Make It an Open and Shut Case

A FEW years ago vapor lock was considered one of the major troubles of the automotive man. At the time a great deal of effort and attention was devoted to this frequently unrecognized condition by refinery technicians and vehicle designers, with the result that there was some improvement in the fuel and more improvement in the design of the fuel system. These improvements removed the greater part of the curse from vapor lock in the passenger car and the bust but not necessarily from trucks.

The reason that vapor lock is still with the fleet operator of trucks is because there is no standard that the truck engineer can use as a basis of design. Trucks have special bodies with various locations for the fuel tank or tanks and consequently it is impossible for the completed truck to have a standard location for fuel lines. Many trucks are shipped as a stripped chassis to a body builder who mounts the fuel tanks as part of body building in any location that is available when all of the other requisites have been met. Since the body builder is not particularly well versed in vapor lock problems, it is not surprising that upon completion of his work there is a vapor lock problem. In addition to getting the fuel system close to such hot parts as the exhaust system, frequently the fuel tank is placed where it is effectively shielded from the air stream, in which case the fuel heats up before it ever leaves the supply tank.

In order to have quick starting it is necessary to have highly volatile fuel. That is, fuel that will gasify very readily at relatively low temperature. What happens in the case of vapor lock is that the fuel turns to gas before it gets to the carburetor, and when this happens you can look for one or more of the following troubles:

1. Stalling or uneven running upon idling after a hard run.
2. Stalling or uneven running in slow-moving traffic.
3. Occasional stalling even at high engine speed.

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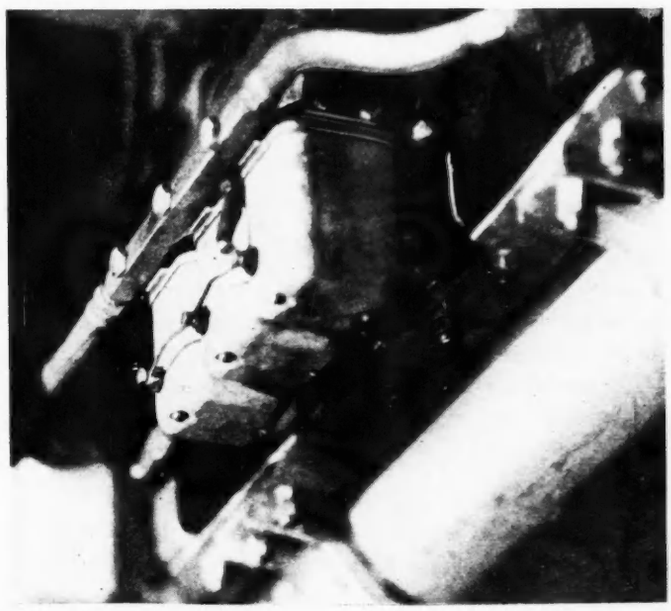
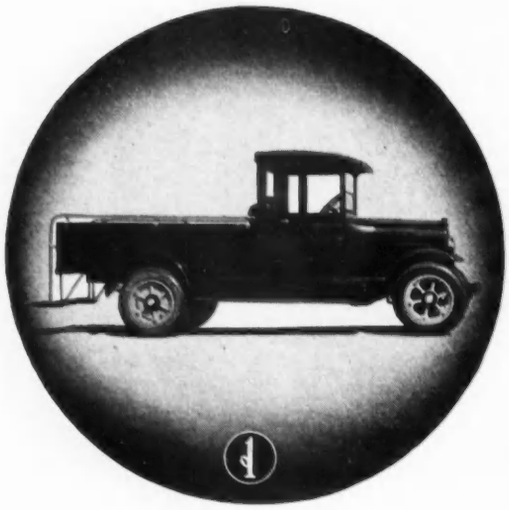


Above: The electric fuel pump is installed as a pusher. Top: A metal shield helps keep heat from the mechanical fuel pump

By Henry Jennings

Technical Editor, Commercial Car Journal

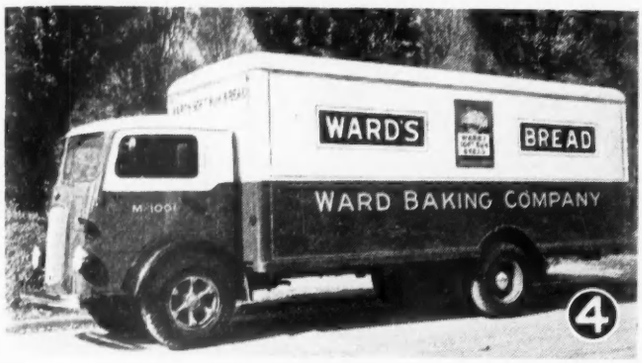


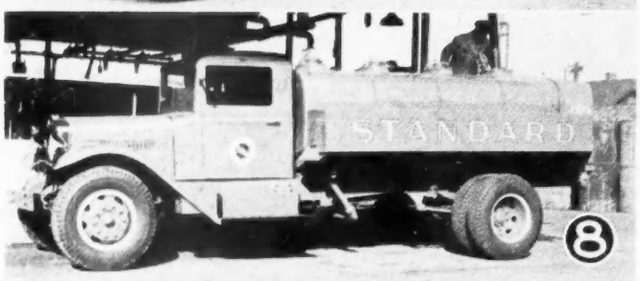
THE ANTIQUE ALBUM

1 & 2. Helmets were literally gone with the wind when the rescue squad rode and carried equipment in this airy model of Dodge fire truck. Today the smart closed 1938 model is not only faster and more efficient but it actually makes attendance at the fire a downright pleasure

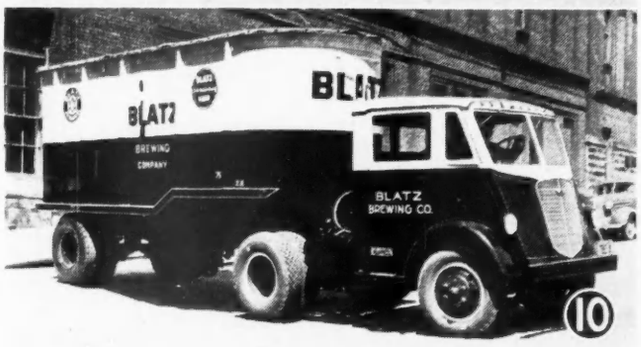
3 & 4. This Mack with brass radiator and hand-driven horn was hauling bread for Ward at about the time you were whistling Dardanella. At the right is the smarter, larger, faster Bei Mir Bist Du Schoen model build by Mack and operated by the same baking company in the swing era

5 & 6. You never could tell from the solid-tired Federal whether Coca-Cola was a brand of bricks or poultry food. However the modern version by Federal has all of the verve of the pause that refreshes. Also it gets more Coca-Cola to parched palates in less time for less money





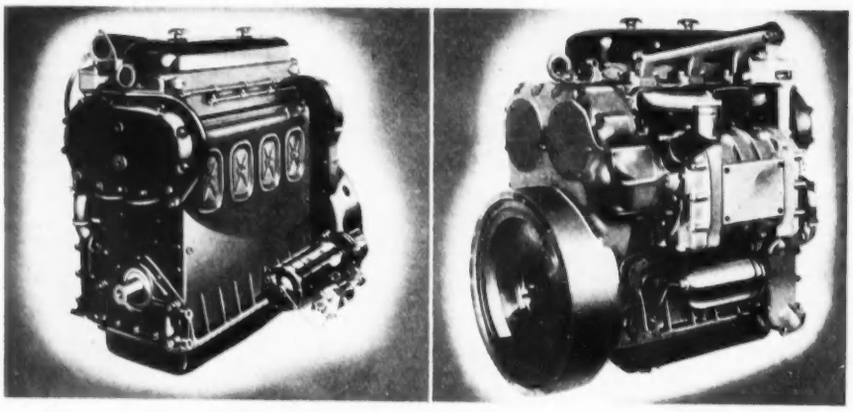
The MODERN ALBUM



7. & 8. The old-time picture was taken when people looked up to the truck driver because of his high position. In many localities it was illegal to haul gasoline in tanks so the driver stepped down from his exalted position at each stop and wrestled drums. His life is less strenuous now thanks to Sterling's marked improvements

9 & 10. The pre-prohibition tractor-trailer outfit is a let-that-be-a-lesson-to-youse study in load distribution. The beer-laden trailer looks as if it had almost caught up with the high-hat-cabbed Available tractor. In modern dress the Blatz combo struts the suds slickly

11 & 12. When storm warnings went up along the coast the driver of this venerable GMC put up the hurricane curtains and prepared for the Nor'easter with more hope than conviction that he would be able to see the road. Today he tools along comfortably regardless of weather. He does more work, gets home earlier in better condition



New Truck Series Available in Three, Four and Six-Cylinder Models

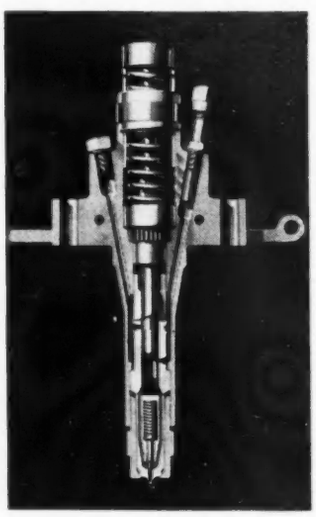
GM'S 2-CYCLE DIESELS

THREE new diesel engines for trucks have been announced by General Motors. All are two-stroke cycle engines using a Roots type supercharger. The smallest is a three-cylinder engine, the next is a four-cylinder and the large one has six cylinders.

All engines of the 71 series, which is the truck series, have a cylinder bore of 4¼ in. and a stroke of 5 in., giving a cubic-inch displacement of 213 for the 3-71; 284 cu. in. for the 4-71, and 425 cu. in. for the 6-71. The maximum horsepower rating for each is 80 hp., 107 hp., and 160 hp. at 1800 r.p.m., respectively, and a continuous rating of 45, 60, and 90 hp. at 1200 r.p.m. Maximum torque for all engines develops at 800 to 1000 r.p.m. and is 283, 375, and 562 lb. ft. respectively.

The weights of the three engines are 1160, 1330 and 1635 lb., including starter, governor, oil cooler and oil and fuel filters. This makes the specific weights 14.5, 12.4 and 10.2 lb. per hp. on the basis of maximum ratings. These ratios compare favorably with gasoline engine ratios, which average about 12 lb. per hp.

ONE of the interesting features of these engines is that the entire cylinder block and supercharger assembly can be turned end for end without disturbing the flywheel or gear train and thus place all of the accessories on the opposite side. In similar manner the cylinder head can be reversed regardless of the position of the supercharger, placing the exhaust and water manifolds on either the opposite side or the same side as the supercharger. By shifting one gear in the train and changing the camshaft and oil pump cover, rotation of the crankshaft can be made either clockwise or counter-clockwise with any accessory arrangement.



The generator and air compressor can be mounted over the timing gear housing and driven directly from the camshaft, or they can be attached to the side of the crankcase and driven by belt.

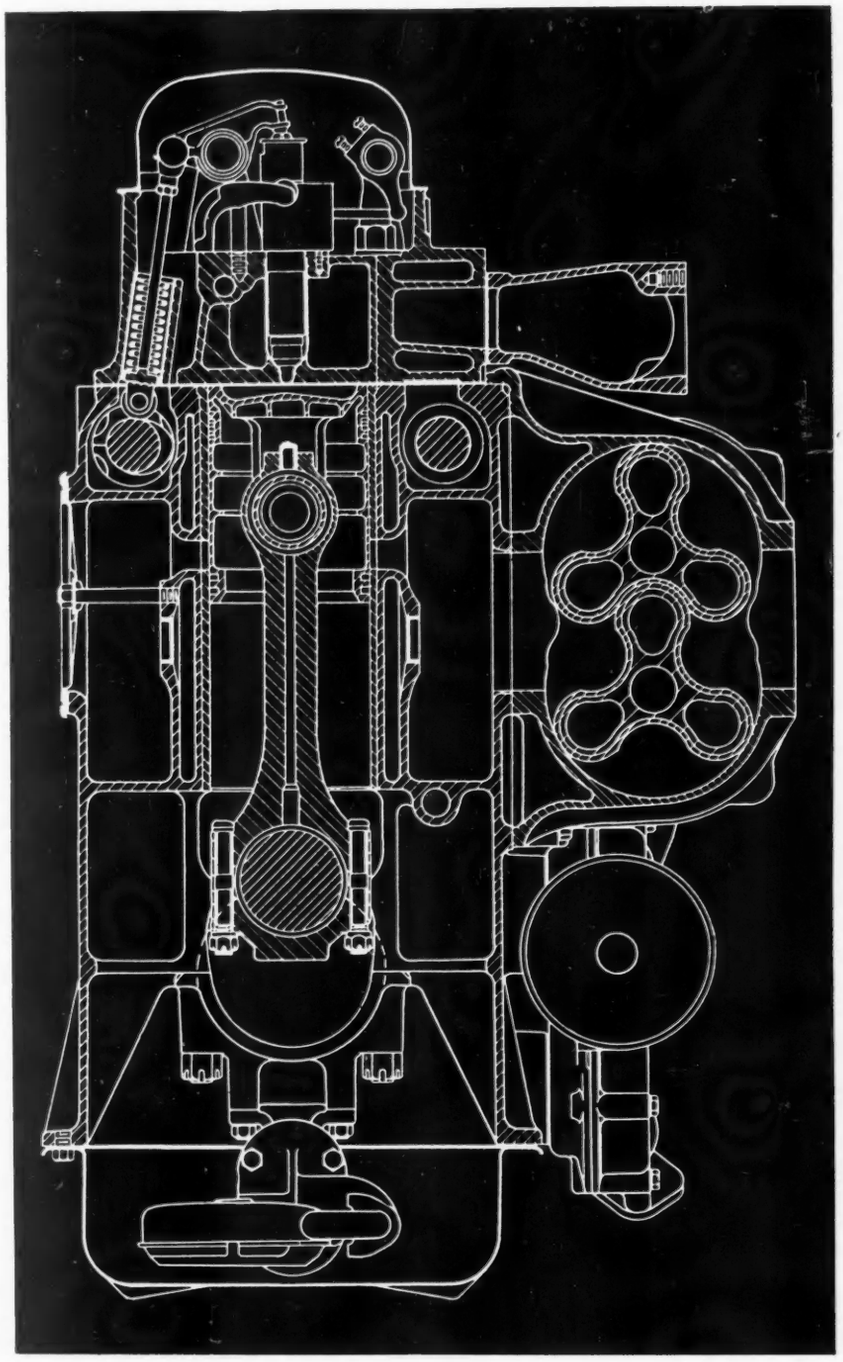
This flexibility makes possible eight variations of each model, all of which will make for accessibility in camelback trucks.

For lubrication the engines use ordinary SAE 20 oil in winter and SAE 30 oil in summer. Fuel is ordinary furnace oil such as is used in the ordinary home heating plant. The

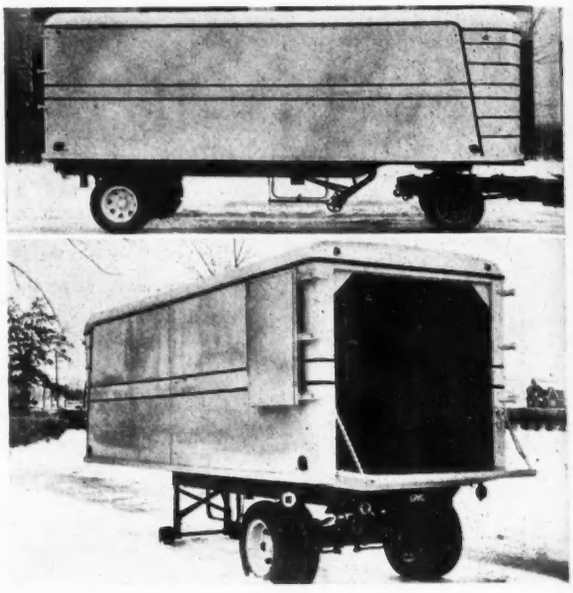
(TURN TO PAGE 60, PLEASE)

At top of opposite page are the new 4-71 (left) and 3-71 (right) engines, 4 and 3-cyl. models of the new GM line. Not shown but similar is the 6-71. As illustrated blower and accessories are on right but opposite arrangement is available. The injector (at bottom of opposite page) is mounted in the head between the two exhaust valves. The cross section drawing below is of model 3-71. Note the Roots-type supercharger mounted on the side and connecting with the air pressure chamber which surrounds the cylinders. A port on each side of each cylinder admits air to the firing chamber at the proper time

All with Supercharger, Reversible Block and Interchangeable Parts



GMC
TRAILER BODY



Right: appearance of GMC's new light-weight trailer body is enhanced by belt and top moldings which blend with the oval front

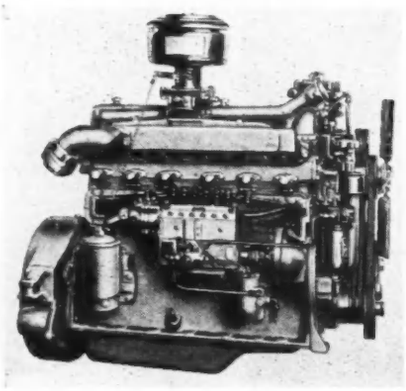
DESIGNED to keep pace with modern streamstyled truck and tractor units is the new GMC trailer body announced by General Motors Truck & Coach Division of Yellow Truck & Coach Mfg. Co.

The basis of the construction is an all pressed steel framework which has reinforcing corner angles at vital points for added strength. Streamlined in sizes ranging from 6 to 15 tons' capacity, the new GMC trailer body is of lighter weight despite its greater strength and durability.

The new body has an oval front, and Pullman-type roof. Tail gate is attached with a continuous hinge and doors above the gate swing open fully.

Especially suitable for over-the-road freight hauling, the body is adapted to a straight frame or drop frame design of trailer. If desired, fenders and drop skirting may be added. Standard or refrigerator type construction is available.

NEW BUDA DIESELS



Buda's new six-cylinder diesel 6-DT-315

The Buda Co., Harvey, Ill., has announced a new six-cylinder diesel engine—the 6-DT-315. It has a 3¾ in. bore and 4¾ in. stroke for a piston displacement of 315 cu. in. Horsepower is 83 at 2400 r.p.m. and maximum torque is 205 lb. ft. at 1300 r.p.m.

It is the same design and construction as all other Buda diesels. All have the Buda-Lanova combustion chamber. This model has a 3 in. crankshaft and seven main bearings. Lubrication is by full pressure and valve seats are replaceable. Net weight is 1180 lb.

Another recently introduced Buda diesel is the four-cylinder, 4-DT-196. It has a 3⅝ in. bore and a 4¾ in. stroke. Piston displacement is 196 cu. in.

HEAVY-DUTY WALTER

The Walter Motor Truck Co., Long Island, N. Y., has developed a model ADV 150 hp. diesel, 10 to 15-ton capacity, for use with dump bodies in heavy excavation work and as tractors for log hauling or other heavy service. It embodies the Walker four-point positive drive system and the six-cylinder diesel engine is a Cummins 6-HB.

The transmission is a unique tractor type providing six forward speeds and two reverse. High gear permits speeds of 30 m.p.h. while low gear reduction is 125 to 1.

For dump service a 126 in. wheelbase is used having a CA dimension of 8 ft. For semi-trailers a 114 in. wheelbase is available and for pole trailers a 138 in. wheelbase is furnished.

Hydraulic steering can be supplied when required.

The 126-in.-wheelbase Walter model ADV

CRETE-MOBILE

Latest offering of Hercules Steel Products Co., Galion, Ohio, is the Crete-Mobile, a truck-mounted and truck-operated device for placing concrete pneumatically. Air compressor, water tank, mixing tank, hose and discharge nozzle are all included and powered by the truck motor through a Hercules power take-off.

Hercules Crete-Mobile on 1½-ton Chevrolet

with

BENDIX *Hydraulic* STEERING STABILIZER

- ✓ **BLOWOUTS** of any tire at any speed have no effect.
- ✓ **ROUGH ROADS** are no strain on driver's muscles.
- ✓ **BROKEN PAVEMENTS** may damage springs, but won't swerve truck.
- ✓ **ROCKS OR LOGS** as long as not too high for wheels to surmount, won't swerve truck.
- ✓ **CURBINGS** same as rocks or logs—no hazard if this unit is used.
- ✓ **SOFT SHOULDERS** make any turning harder, but *cannot take charge* of the Bendix Hydraulic Stabilizer equipped trucks!

THE DRIVER'S LIFE, THE LOAD, THE VEHICLE ITSELF DESERVE THIS VERY LOW-COST PROTECTION

No shock from the road can take the wheel from your driver's hands or even jerk it, if your truck is equipped with a Bendix Hydraulic Steering Stabilizer.

What this enormously powerful yet compact unit actually does is to make the truck's steering gear irreversible, without hampering the steering action at all.

Sensationally, exhaustively and repeatedly proved before thousands of skeptical spectators. Installed and already holding an impressive life-saving record on many thousands of cars, trucks and buses.

Quickly installed—no drilling—no tampering with steering hook-up—no substitution for any part of truck.

Protect your drivers—your trucks—your loads—your good-will, by having a Bendix Hydraulic Steering Stabilizer installed on every truck in your fleet. Ask your Bendix dealer, or write—

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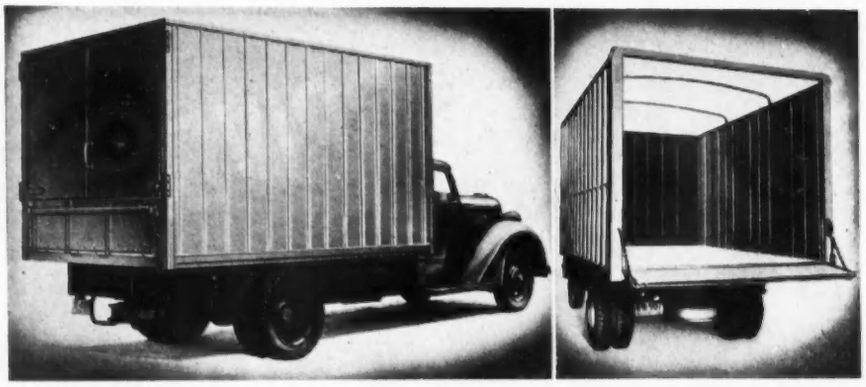


The new Highland truck body is offered with permanent top or tarpaulin bows. Each of the major panels comes as a completed unit, ready for final assembly

KNOCK-DOWN BODY BY HIGHLAND

THE Highland Body Mfg. Co., a part of The Trailer Co. of America, Cincinnati, Ohio, has announced a new knock-down truck body at a low price. It is completely framed and all welding, cutting, trimming, drilling and finishing operations have been performed so that nothing more is necessary to complete the assembly than a hammer and two wrenches. Inexperienced mechanics can do the job in not more than 30 labor hours.

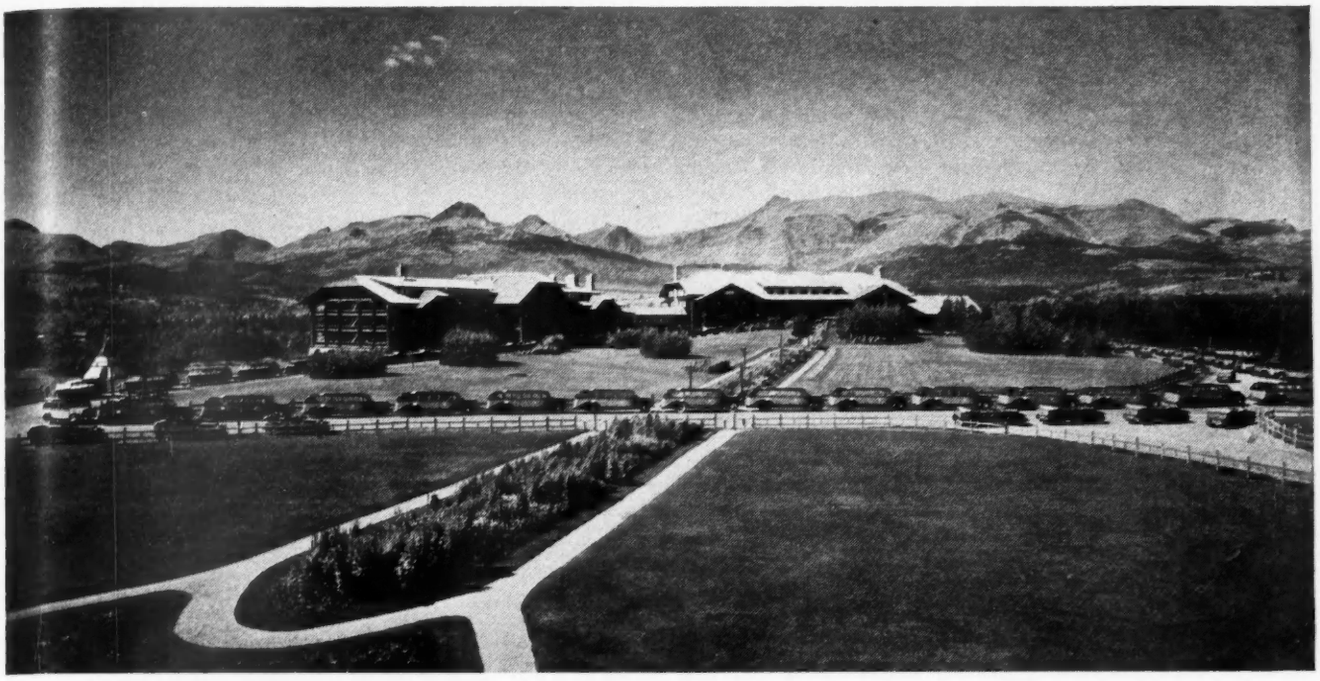
The understructure of the body is so arranged that it can be used on any truck chassis regardless of the width or length of the frame without drilling or burning any part of the truck chassis which might weaken it. The ends, sides, and roof are each made in one complete piece, with steel ribs instead of posts and with hollow steel corner posts for greater strength and lighter weight. Each of these five major pieces is completed with steel rub rail at the bottom and protecting angle rail welded at the top. An outstanding feature is the completely framed rear section in which the bottom bolster, top header and two corner posts are welded in one unit with stiffening braces or gussets which square the entire body and prevent it from weaving out of shape. The rear end is finished with double doors, 18-in. tailgate, chain and door lock.

According to the manufacturer, price is at least 25 per cent below that of any product of similar quality. Length of the body is 12 ft. furnished with either closed top or open top and tarpaulin bows.

New Truck Registrations by Makes by Months*

	Autocar	Brock-way	Chev-rolet	Diamond T	Dodge	Federal	Ford	G.M.C.	Interna-tional	Mack	Reo	Sterling	Stewart	Stude-baker	White-Indiana	Miscel-laneous	Total
January.....1937	130	102	14,362	863	3,764	207	16,544	2,820	6,244	389	354	29	92	169	592	948	47,609
January.....1936	75	94	15,124	495	6,207	223	14,606	428	4,743	90	339	8	85	143	493	807	43,760
February.....1937	112	115	7,939	602	5,043	206	16,460	3,051	5,256	364	317	26	101	222	550	1,451	41,815
February.....1936	57	88	14,978	510	5,556	170	12,226	758	4,365	107	217	4	62	134	408	661	40,301
March.....1937	179	140	17,164	849	6,498	241	20,839	4,201	5,290	480	495	23	149	478	655	2,080	60,291
March.....1936	88	127	19,511	634	6,751	205	16,168	1,551	5,395	184	264	17	73	221	477	762	52,428
April.....1937	228	184	22,707	916	4,090	258	22,897	4,815	6,894	594	394	47	121	725	819	2,193	67,882
April.....1936	121	179	23,323	784	8,817	271	18,493	2,733	7,308	289	379	21	112	327	700	1,099	64,956
May.....1937	198	183	20,772	867	6,045	301	20,452	4,536	7,279	588	424	28	120	720	795	2,549	65,857
May.....1936	109	168	21,443	754	8,507	275	17,971	3,045	6,704	440	399	16	116	358	719	1,159	62,183
June.....1937	199	139	17,177	685	6,191	226	17,760	4,146	6,925	540	454	33	94	651	678	2,728	58,626
June.....1936	96	137	19,045	660	7,777	287	16,930	2,820	6,151	427	325	28	113	320	599	1,136	56,851
July.....1937	281	152	17,011	719	6,333	219	18,262	4,088	7,348	607	445	34	104	587	654	2,607	59,451
July.....1936	137	207	20,769	786	7,855	268	18,012	3,363	6,928	483	366	22	131	350	729	1,029	61,435
August.....1937	171	134	18,806	627	6,665	158	15,859	4,394	7,446	421	317	14	87	541	508	2,533	58,681
August.....1936	139	163	20,356	759	8,071	242	15,954	2,977	6,115	426	313	39	124	314	621	915	57,528
September.....1937	183	94	16,252	623	6,346	128	15,791	3,496	6,460	406	249	31	75	350	502	2,130	53,116
September.....1936	122	138	15,177	795	7,788	240	16,613	3,112	6,514	418	515	15	139	317	634	741	53,276
October.....1937	194	129	10,511	474	5,042	163	10,103	3,165	6,367	432	275	20	79	261	657	1,561	39,433
October.....1936	159	155	7,752	959	7,389	255	11,363	2,736	6,529	506	516	38	133	343	803	680	40,314
November.....1937	149	119	8,191	383	3,807	121	4,508	2,281	4,948	342	192	14	66	179	480	1,144	26,924
November.....1936	180	134	9,925	663	5,218	228	5,050	1,241	4,773	396	247	34	98	199	649	576	29,611
December.....1937	150	102	10,323	365	3,480	94	7,712	2,030	4,292	313	250	10	49	182	378	1,182	30,912
December.....1936	162	105	14,500	735	4,311	228	11,700	1,747	5,511	428	290	30	85	209	567	724	41,332
Twelve Mos.....1937	2,174	1,593	181,212	7,973	63,304	2,322	187,187	43,023	75,279	5,476	4,166	309	1,137	5,065	7,268	23,106	610,594
Twelve Mos.....1936	1,445	1,695	201,903	8,534	84,247	2,892	175,086	26,511	71,036	4,194	4,170	270	1,271	3,235	7,399	10,089	603,977
% Change...12 Mos.	+50	−6	−10	+6	−25	−20	+7	+62	+6	+31	.....	+14	−11	+57	−2	+131	+1

* Does not include returns from Wisconsin since June, 1937. All data are on a comparable basis.



Fleet of 80 Exide-equipped buses and cars takes visitors through Glacier National Park

THE units in this fleet owned by Glacier Park Transport Company operate at an altitude of 5000 feet and higher, taking visitors on a mountain tour through some of the most beautiful scenery in the world. Vehicles are kept in the pink of condition, for they must all be ready to start their trips on an instant's notice. It is not surprising that they are equipped 100% with Exide Batteries.

In trucks and commercial vehicles the country over, Exides have proved their ability to hold costs down, to give long, dependable service under the toughest conditions, and to keep battery maintenance at a minimum.

There is a line of Exide Batteries especially designed to take care of 90% of all commercial vehicles, in addition to the heavy-duty Exide line for large trucks. See your Exide Wholesaler today for the facts on this entire line.

Exide

COMMERCIAL TYPE BATTERIES

WITH MIPOR AND SLOTTED RUBBER

"MIPOR," Reg. U. S. Pat. Off.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia

The World's Largest Manufacturers of Storage Batteries for Every Purpose

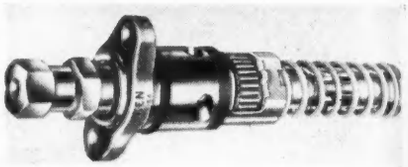
Exide Batteries of Canada, Limited, Toronto

When writing to advertisers please mention Commercial Car Journal

NEW PRODUCTS ON PARADE

Timken Renewable Pump Unit

Renewable pumping units having a plunger diameter range from 4 mm. to 9 mm., for use in Timken Fuel Injection Pumps are now available. These represent the latest advance in commercial fuel injection equipment and greatly simplify servicing in the field. The units are pre-metered at the factory, thus eliminating any pump calibration or metering in the field at the time of installation and can be installed in a few minutes. The low cost of a new pumping unit permits the operator to stock a spare service unit or

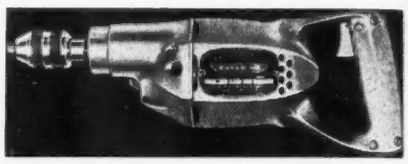


set, thus avoiding loss of valuable engine time or the expense of keeping a spare fuel injection pump on hand at all times.

New Jahn Utility Trailer

The C. R. Jahn Co., Chicago, announces a new light-weight utility trailer for the transportation of the lighter types of machinery, such as tractors, compressors, pumps, and small shovels and cranes. The new trailer, which will handle loads efficiently from 5 to 15 tons capacity, incorporates many new and interesting features.

B & D Low-Speed Drill



Black & Decker Mfg. Co., Towson, Md., has a new low-speed ¼-in. drill particularly adapted for use on stainless steel and other hard metals. Standard no load speed is 450 r.p.m.; full load at 285 r.p.m.

Streamline Wayne Compressor

An air compressor of entirely new design has been introduced by the Wayne Pump Co., Fort Wayne, Ind. The entire mechanism is enclosed in a streamlined cabinet which becomes an integral unit with the special tank. Seven, 10 and 14 cu. ft. ca-

pacities are available all being equipped with the same two-cylinder two stage motor. Smaller capacity models operate at lower speeds and to increase the output of the unit it is only necessary to replace the motor and drive pulley with a larger model.

(Turn to Page 40, Please)

TRUCK DELAYS ARE NOT ALWAYS THE DRIVER'S FAULT . . .

● Perhaps the office is responsible. And *that* discovery leads the way to truly enormous savings.

Here's a truck waiting for its load for 2 *hours,* at a cost of $2 or $3 an hour! Here's a truck with a short afternoon route, getting in at 3:30 and nothing more to do till closing time.

Many Causes for Lost Time. Here's a truck that's up against a hold-up at the freight station, which could be corrected; here's a truck bucking the rush hour traffic unnecessarily; here's a truck that needs a helper; here's a truck that's overworked, causing expensive overtime!

POINTS OUT ALL DELAYS!

Time, time, time! It's all a problem in TIME—and of course the *Servis Recorder* gives you all this information, on its chart, at a glance. It gives you the clue, it points the way to a proper arrangement of your whole truck system, where the driver is only a small part of your problem. Write for free booklet: "Ten Ways of Getting More Work Out of Motor Trucks."

THE SERVICE RECORDER CO.
1422 Euclid Ave. • Cleveland, Ohio

The Servis Recorder
Tells Every Move Your Truck Makes

"But you make the mistake, yes?"

MONSIEUR DUVAL: You have cheated yourself, is it not so? You have charged me but 19 cents a gallon for the gasoline.

GULF: That's right—19 cents is the cost around New York. And 5 cents of that 19 cents is really not for gasoline but for taxes. If it weren't for state and federal taxes, this gas would sell for 14 cents a gallon.

MONSIEUR DUVAL: But that is magnificent! In my country the petrol costs more than 52 cents for a United States gallon. I have driven my car throughout Europe, and everywhere the gasoline is dear. In Germany, it is 53 cents a gallon; in England more than 30 cents. And in Italy the motorist must pay 80 cents the gallon!

I do not understand how you in America have the gasoline so cheap.

GULF: Well, it's partly because America is fortunate enough to have a bountiful supply of crude oil, from which gasoline is made.

But also it's because the petroleum industry has never stopped trying to develop new ways of bringing down the cost of gasoline.

MONSIEUR DUVAL: Ah, your American industry, it works miracles.

GULF: You could almost call it that, yes. In 1920, for example, gasoline cost about 32 cents a gallon, without tax. Today it costs considerably less than half that.

MONSIEUR DUVAL: It is very good, your gasoline. Better, I think, than we get in Europe.

GULF: Yes, gasoline here in America *is* very good. And it has become steadily better while the price was being steadily lowered. In the year we mentioned before—1920—the octane rating (a measure of quality) of good gasoline was 52. Today it is 70 or more.

MONSIEUR DUVAL: But your supply of crude oil, it cannot last forever! Are you not wasting it?

GULF: No, we are not, thanks again to our scientists in the petroleum industry. They have done marvelous work in getting more and more gasoline out of a barrel of crude oil.

As a matter of fact, the new refining methods developed by petroleum scientists save America about one billion barrels of crude oil each year—oil which would otherwise have to be brought to the surface.

In other words, chemical research has, in effect, *doubled* the oil reserves of the United States.

MONSIEUR DUVAL: You Americans! Everything you make better while you make it cheaper—the motor car and the gasoline both!

GULF OIL CORPORATION GULF *GULF REFINING COMPANY*

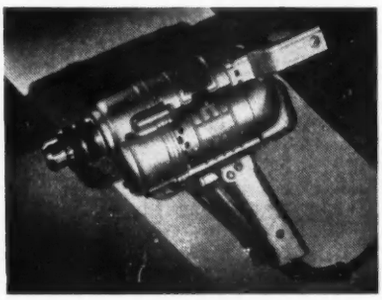
When writing to advertisers please mention Commercial Car Journal

NEW PRODUCTS

(CONTINUED FROM PAGE 38)

Thor 9-Lb. ½-in. Drill

A new ½-in. electric drill has been announced by the Independent Pneumatic Tool Co., 600 W. Jackson Boulevard, Chicago. Known as the THOR U44, it weighs only 9 lb. and is 12 in. in overall length. A heavy-duty tool, designed for continuous service on production. At the same time, its light weight and small size give it the portability and carrying ease necessary for maintenance work. The U44 can be furnished with 110 or 220 AC or DC Universal motor which operates from any electric light socket. Free speed is 450 r.p.m. and full load speed 300 r.p.m.



Ribbon Blade Regroover

A new line of both pull and push type tire groovers has been developed by the Kwick-Kut Mfg. Inc., St. Louis, Mo. In addition to doing all regular pattern regrooving the use of the narrow blade, grooving across the tire, results in an unusual non-skid feature. The cross skids not only reduce skidding to a minimum but also give quicker starting and stopping.

MORE NEW PRODUCTS ON PAGE 68

If
IT SAVES YOUR LIFE
only ONCE
it's worth it!

No. 149 Nu-Ray Universal Stop and Tail Lamp with bracket. Easily attached. List Price $1.50.

But the Nu-Ray principle incorporated in this patented Do-Ray stop and tail lamp will protect you from mishap many times. The lamp throws a light in almost every direction. It can be seen from the rear, side, top, or bottom. Available in a number of models for cars, trucks, busses, and trailers.

Investigate the Nu-Ray and the many other life-saving lights in our complete line. See your jobber or write

DO-RAY LAMP COMPANY
1458 S. Michigan Avenue, Chicago

DO-RAY
SAFETY LIGHTING DEVICES

LITERATURE FREE

Note: The following items may be obtained by writing direct to the manufacturer.

Sizes and Weights

A new edition of "Truck and Trailer Size and Weight Restrictions," by States, has been prepared by Four Wheel Drive Auto Co., Clintonville, Wis.

K-D Lighting Chart

The K-D Lamp Co., 610 W. Court St., Cincinnati, Ohio, has prepared a condensed chart showing lighting and safety equipment required by the ICC and the individual States.

Compensating Data

A brochure describing the functions and advantages of the compensating trailer axle is available from Detroit Compensating Axle Corp., 60 Broadway, New York.

"Acco Products"

"Acco Products" is the title of a new booklet by American Chain & Cable Co., Inc., Bridgeport, Conn., a handy 12-page reference book of company products.

Compressor Bulletin

The Ingersoll-Rand Co., Phillipsburg, N. J., has a new bulletin on small industrial compressors and vacuum pumps covering the "Type 30" line from ¼ to 15 hp.

Packless Products Data

An engineering data folder, in file form, has been issued by Packless Metal Products Corp., Long Island City, N. Y.

Edison Battery Manual

Thomas A. Edison, Inc., Emark Battery Division, Kearny, N. J., has a new battery operating manual. Specifications of passenger car, commercial, truck and bus batteries are given as well as a complete technical and service section.

Form-A-Gasket Manual

An illustrated booklet telling of the experiences of Milt Marion, well known race driver, and including Form-A-Gasket service suggestions has been released by Permatex Co., Sheepshead Bay, N. Y.

THIS insulation investment LASTS A LIFETIME

● You may think that refrigerated truck-body insulation can never be harmed—since it is hidden away in the walls and is protected by the wall panels.

In actual fact, it can be destroyed (and the money invested in it wasted) by two unseen destructive forces—water vapor and vibration.

Because it resists these same destructive agents, thousands of fleet operators and superintendents today insist on using Dry-Zero insulation. These experienced men know that Dry-Zero repels water and does not turn into a useless, sopping wet mass. They know it is not destroyed, does not collapse under the constant vibration of the truck.

In other words, Dry-Zero remains an efficient insulation for life, despite these two unseen destructive agents. It will give the same highly effective insulation protection to your merchandise from the day the truck goes into service until it is retired. You can be sure that your Dry-Zero insulation investment will last a lifetime.

12 Years of Service

Insulation gets hard service in railroad refrigerator cars. Yet, photographed to the right is a sample of Dry-Zero taken from a car after 12 years of use. This Dry-Zero was examined by experts, declared good as new, and put back into use.

This is only one example. Numerous tests and numerous records prove the long life of Dry-Zero insulation in refrigerated trucks and domestic refrigerators. They also prove that you can expect life-long service from Dry-Zero.

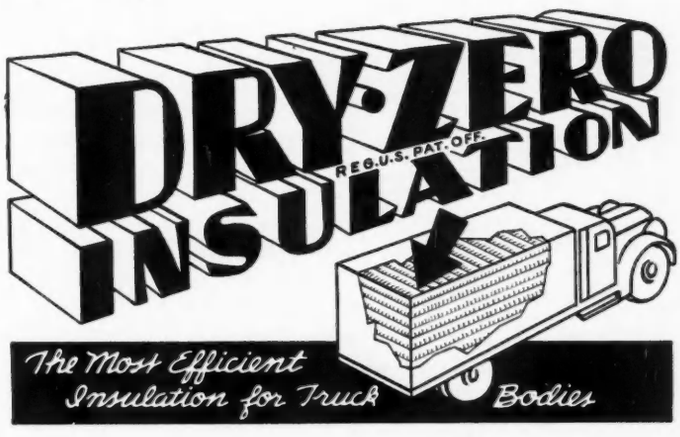
DRY-ZERO INSULATION FROM CAR 12 YEARS OLD

For Modern Trucks

Consider the insulation problem of the truck operated by the Jack & Jill Ice Cream Co., Chicago. This truck must carry 1970 gallons of ice cream at zero F. over a daily route schedule 16 hours long. This means severe refrigerating and insulating conditions. Therefore, the owner as well as the body builder (H. McFarlane & Co., Chicago) chose Dry-Zero insulation.

INSULATION ADVICE

Submit your truck insulation problem to the Dry-Zero Engineering Department. You will receive in return an unbiased report on the insulating requirements. Information needed by the Engineering Department is: body dimensions; merchandise to be carried; time in transit; and required temperature.



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NEWS SUMMARY

Truck Output in '37 Topped 1936 Figure by 16 Per Cent

Final figures for truck production in the United States and Canada during December totaled 88,117 units, a gain of 31 per cent over the November output of 67,508 units. Compared with December, 1936, when 77,636 units were produced, the gain was 14 per cent. For the year 1937 total output was 948,071 units, compared with 818,377 in 1936, a 16 per cent gain.

For 1937 new truck registrations by make by month see page 36.

SAE To Hold Utility Meeting

An SAE Section-Regional Transportation & Maintenance Meeting devoted to Public Utility Fleet Operations will be held in the Hotel Statler, Cleveland, Ohio. April 28-29.

Road Bureau Reports to Congress

The Bureau of Public Roads recently made public a report to Congress recommending measures to reduce the highway accident toll. Emphasis was placed on the importance of uniform traffic laws and upon the need for scientific study of accident records and the contributing accident causes so revealed. Other sections contain a comparative record of states with and without official inspection systems, a case history of fatal accidents and a study of the accident prone driver.

APPOINTMENTS

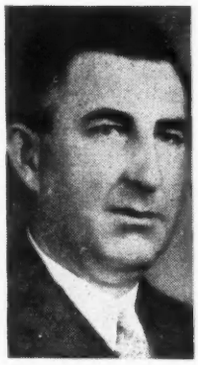
S. E. Heydenfeldt has been appointed service manager of the Reo Motor Car Co. He was formerly manager of Reo's Pacific Coast parts depot.

Clinton Brettell, automotive engineer and fleet operator, has become associated with Hypressure Jenny of New York, Inc., 125 Barclay St., New York, local distributor of Hypressure Jenny steam vapor spray cleaner.

E. F. Hobbins who fills the newly-created post of assistant general sales manager of the White Motor Co. with headquarters at Cleveland. V. W. Fries succeeds him as New York district manager

Tipover Switch division, Durakool, Inc., announces the appointment of P. A. Richardson as sales manager. Twelve representatives have been appointed in various parts of the country.

Allen W. Morton has been elected vice-president of Koppers Co. He will continue in charge of Koppers' American Hammered Piston Ring division at Baltimore, where he has been general manager.

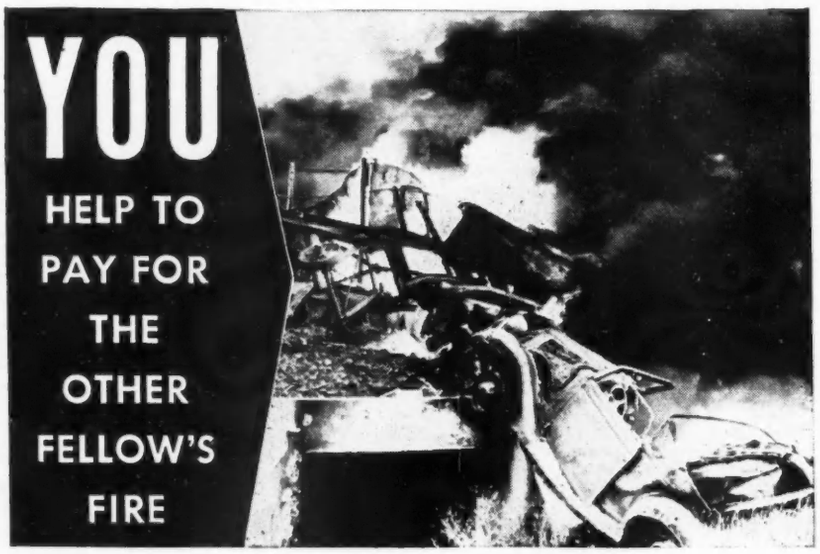


M. S. Brooks who recently was named president of the Studebaker Corp. of Canada. For the past three years he has been vice-president and general manager of the corporation

Laminum Agent

Laminated Shim Co., Inc., Long Island City, N. Y., has appointed Industrial Sales and Engineering Co., 501 Citizens State Bank Bldg., Houston, Texas, to act as exclusive agent in the Southwest for the sale of Laminum and other types of shims. J. H. Drapier and W. R. Davis, partners of this sales firm, are both well known throughout the oil country.

(Turn to Page 44, Please)

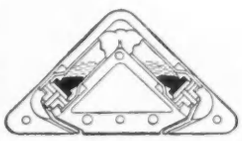


Every truck or trailer that burns — every dollar's worth of cargo damaged by fire — costs you money, because it keeps insurance rates higher than they should be.

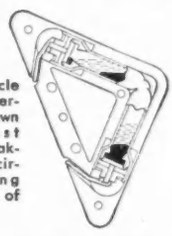
● The only way you can deserve a better insurance rate is to take extra precautions to reduce your risk. The Durakool Tipover Switch *does* reduce fire risk because it cuts off ignition at the instant of overturn. Most on-the-road fires result from overturn, and most of these are due to ignition—a spark from a falling or broken wire setting off the gasoline which spills when float valves are turned sideways or gasoline lines are broken.

A few dollars spent for a Durakool Tipover Switch, and a few minutes spent in simple installation, may save you thousands of dollars fire loss. Even if you are insured, it's better not to have a fire.

Durakool Tipover Switches are approved by Underwriters' Laboratories and are sold through automotive jobbers. If your dealer can't supply you, please write to the factory, giving his name.



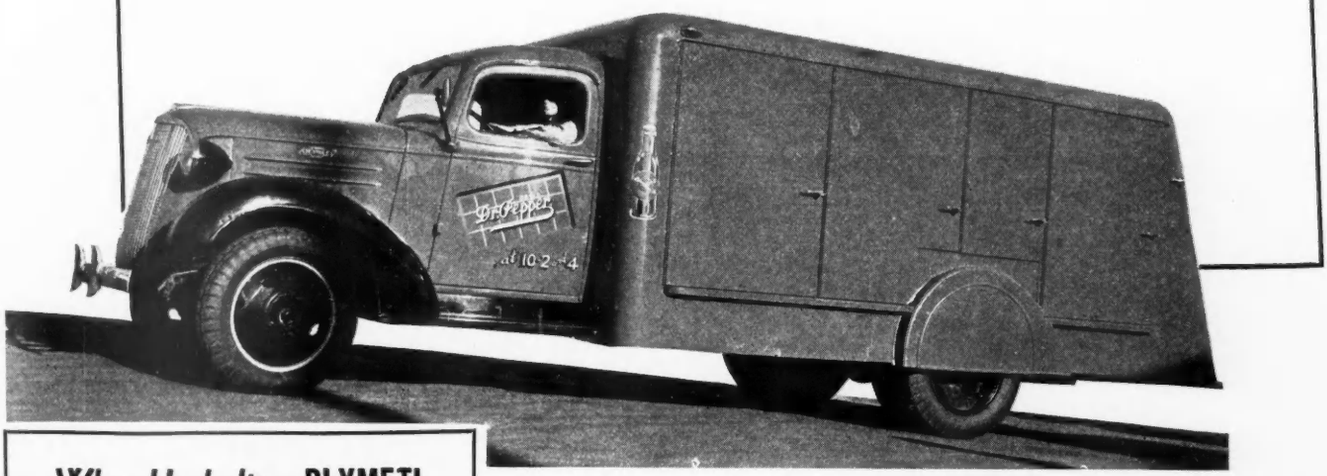
Two mercury switches—of metal, not glass—are placed in series in the ignition circuit.



When vehicle tips 45°, mercury flows down in top most switch, breaking ignition circuit, ending any chance of spark.

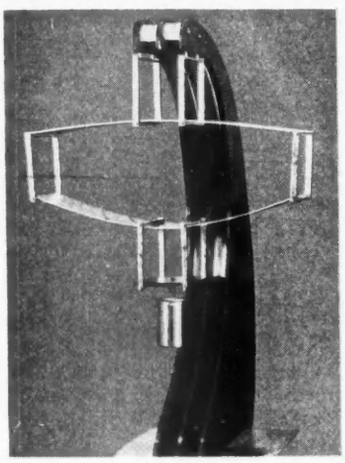
TIPOVER SWITCH
DIVISION
DURAKOOL, INC.
1096 North Main Street, Elkhart, Indiana

"PLYMETL..." *for important builder and owner economies*



Body of Haskelite VE "Plymetl" (metal one side) by American Body & Trailer Co.

Why Haskelite PLYMETL Saves Space in Truck Bodies



This demonstration shows a strip of 3/16" VE Plymetl at the top—a strip of 22 gauge steel of the same weight, length and width below. Both the Plymetl and sheet steel support an identical weight yet the steel strip bows much more.

The greater stiffness of Plymetl assures savings in construction costs, savings in deadweight, and eliminates many of the space-consuming internal braces and uprights required when sheet steel is used.

● Prominent among the advantages of Plymetl for commercial bodies are substantial economies during both construction and operation. Strong, stiff, light in weight . . . and exceptionally workable . . . it eliminates many costly fabricating operations. The builder is able to offer more payload space, less dead weight, and better overall appearance because the use of Plymetl removes the need for much interior bracing with its excessive bulk and weight.

This weight saving plus the increased space for payload helps the fleet owner move freight at the lowest possible cost per ton mile.

Plymetl's amazing impact resistance minimizes collision damages . . . contributes to extra years of repair-free service. Its freedom from distorting highlights simplifies finishing . . . gives plus value to the owner's advertising display.

Take advantage of Plymetl economy, and many other equally important distinctive features, whether you buy bodies for a single unit or a large fleet. It pays worthwhile dividends throughout the life of the equipment.

HASKELITE

HASKELITE MANUFACTURING CORPORATION

208 West Washington Street, Chicago, Illinois • Offices in Detroit, New York, Los Angeles

When writing to advertisers please mention Commercial Car Journal

NEWS

(CONTINUED FROM PAGE 42)

New Regional Organization For Bendix

O. C. Holaday, sales manager of the Service Sales Division of Bendix Products Corp., announces sales activities will be divided into four regional areas under the supervision of regional managers: Eastern region, F. H. Kroeger, New York City; central region, Samuel V. Harding, South Bend, Ind.; Pacific region, S. F. Dupree, Jr., Los Angeles; southern region, Daniel B. Webster, Atlanta. D. E. Rice, assistant sales manager, will have direct supervision over all regional men.

When NBC's new telemobile unit goes into action, you'll see as well as hear important news events. One of the Mack trucks houses the pick-up cameras and microphones, the other transmits the program to NBC's television station on the Empire State tower

"HAVE YOU SEEN the GOOD NEWS?"

NOW you can get the outstanding advantages of the Eberhard "Big Van Door" Lock at no extra cost over ordinary locks. New manufacturing methods and an increasing demand have permitted Eberhard to make extraordinary reductions in manufacturing costs on its famous No. 5631 lock and, at the same time, retain all the design features, fine materials and quality workmanship. These savings are being passed on to Eberhard customers.

No. 5631 is a *positive* lock and is held closed by a sturdy latch. It can be opened only by actually turning the handle and cannot work open in transit.

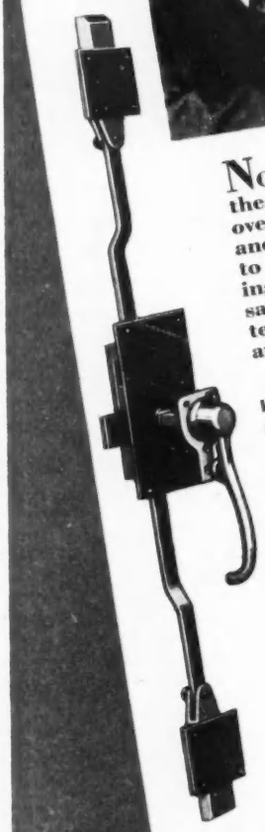
No. 5631 opens easily when the handle is turned. There is no drag on the handle when opening as in locks that are held closed by a spring or similar means.

No. 5631 resists damage. The lock mechanism is fully enclosed in a heavy steel case; the heavy bolt rods are flat and lie close to the door; bolts and guides are ample in size to resist wear.

No. 5631 bolt rods are connected at both ends by through bolts, thus eliminating all bending, binding or loosening.

For complete information on this remarkable new value consult your jobber or write direct to

EBERHARD MANUFACTURING CO.
Division of The Eastern Malleable Iron Company
CLEVELAND, OHIO



EBERHARD "5631"
BIG VAN DOOR LOCK
WRITE FOR THE NEW EBERHARD CATALOG
E

$5000 Grey-Rock Contest

A contest offering $5000 in cash prizes and sponsored by the U. S. Asbestos Division of Raybestos-Manhattan, Inc., is now in progress. The contest is open to fleet shop foremen and mechanics as well as to the service trade. Fifty prizes will be awarded to the best answer in 50 words or less to "why Grey-Rock is the fastest growing line." Entry blanks are being distributed by Grey-Rock jobbers and must be returned before midnight, June 15.

Willys Wins Yosemite Run

Averaging 30.5 miles per gal. a Willys car again led the entire field in low gasoline consumption in the annual Gilmore-Yosemite economy run. Twenty-seven cars of various models and makes in all price classes competed.

Factory sales of new Willys cars aggregated more than $30,000,000 during the first 12 months of operations of Willys-Overland Motors, Inc.

1938 Truck Show Plans

Complete details of the 1938 National truck show to be held in Commerce Hall, Port of New York Authority Bldg., New York, Nov. 9 to 15, have been issued by the National Motor Truck Show, Inc., 973 McCarter Highway, Newark, N. J. Net space available for exhibits will total approximately 100,000 sq. ft. compared with 85,000 sq. ft. used at the Newark show in 1937.

International Sales Report

International truck sales increased from $61,305,000 in 1936 to $76,100,000 in 1937, according to the annual report just released by International Harvester Co. Net income for the entire corporation was $32,493,000 compared with $29,760,000 in 1936.

Corrections

Prices for Studebaker trucks listed in the February issue are for the chassis only except in the case of the Model K5 the listed price of which includes the cab.

A caption in the same issue incorrectly stated engine sizes of the new Mack models EE and EF. Displacement of the EE is 253 cu. in., of the EF, 271 cu. in.

NOW! A REVOLUTIONARY NEW *MONEY SAVING* TRUCK TIRE

- ☆ **It does NOT get dangerously hot**
- ☆ **It licks load and speed problems**
- ☆ **It practically eliminates sidewall breaks**
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SPECIFY THESE NEW SILVERTOWN TIRES FOR TRUCKS AND BUSES

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Vapor Lock

(CONTINUED FROM PAGE 29)

4. Ragged acceleration after idling.
5. Failure to start after being shut down or stalling.

Plenty of this type of trouble was encountered last summer, especially in the large trucks or even in the smaller trucks where the engine was worked hard and the temperatures were high.

AS a result of the research done on vapor lock when attention was more sharply focused on the subject, there are some facts available which give some idea of the reasons for vapor lock. Motor fuel at the average tank outlet is 18 deg. Fahr. hotter than the atmosphere. The temperature may run as high as 30 deg. warmer but in no case will it be less than 8 deg. warmer. At the fuel pump inlet the fuel averages 29 deg. over atmosphere and sometimes as high as 49 deg. and as low as 10 deg. At the fuel pump outlet the average is 41 deg. above atmosphere with a high of 73 deg. and a low of 20 deg. On the average it increases another degree getting to the carburetor inlet but in some cases the temperature may actually drop from fuel pump to carburetor. This seems to make the fuel pump the hotspot of the fuel system considering the big average jump in temperature and the fact that fuel actually cools in some cases after leaving the fuel pump.

When the heat at any point in the fuel system reaches the critical point the liquid fuel may be correctly said to boil. As the result of the boiling the liquid fuel becomes, at least in part, a gaseous fuel. All of the metering devices, such as carburetor jets, etc., are made to measure a liquid fuel. Since the gaseous fuel has about 1/1000 of the value of the liquid fuel, the metering jets, even though they handle the gas accurately, will provide the engine with just about 1/1000 enough fuel with which to operate. Hence the engine stalls or performs badly from too lean a mixture or simply not enough fuel.

To overcome this condition it is obviously necessary to reduce the temperature of the fuel before it reaches the carburetor. If the supply tank can be kept in the air stream so much the better, but this seems to depend upon body design considerations. Since appearance has become so important, tanks have been shielded and concealed by body structure, and there is little chance of getting the tank into the open without some radical change in body design.

The lines running from the supply tank to the fuel pump can be moved away from the exhaust system if they are near it and, if possible, located on the outside of the frame. They can be shielded from the exhaust system by insulation where it is impossible to move them completely away from it.

THAT brings us to the fuel pump, which, from the temperature studies, we found to be a bad offender. The mechanical fuel pump must be mounted on the engine so that it can be driven by the engine. In most cases it is driven by the camshaft. While this pump can be shielded

(TURN TO PAGE 48, PLEASE)

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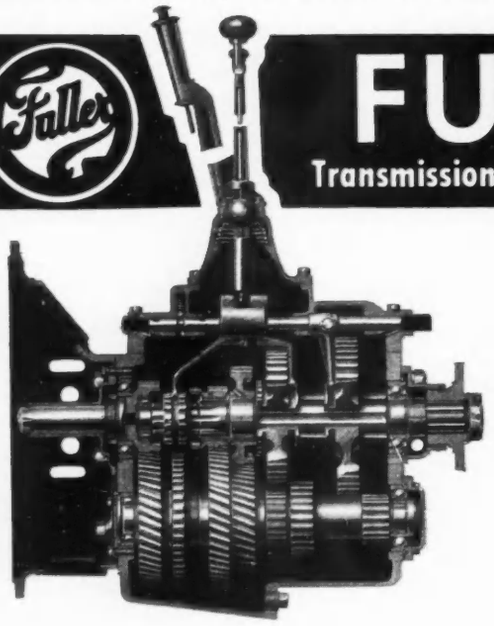

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(CONTINUED FROM PAGE 46)
with insulating material so that some of the radiated heat will not reach the pump, there seems to be very little that can be done with the conducted heat since the pump must be bolted securely to the hot engine.

It will help some to install an asbestos gasket between fuel pump and engine. This gasket, because of its increased thickness, will shorten the effective stroke of the fuel pump some. However, if there is sufficient fuel pump capacity in the original installation the shortening of the stroke by a small amount will not interfere with operation. Similarly, some help can be obtained by installing an asbestos gasket between carburetor and intake manifold. The The gasket can be built up of successive layers of asbestos until it is ⅜ in. to ½ in. thick.

If the mechanical pump is located out of reach of the fan blast there is nothing that can be done about it because there is only one place on the engine that will accommodate the pump drive. Usually there is very little that can be done about directing the fan blast to the pump so that it will have some cooling effect.

THE substitution of an electrical fuel pump for a mechanical pump will solve much of the fuel pump question even in the severe cases. The electric pump, since it is not engine driven, may be located any place along the fuel line. Mounted away from the hot engine, no heat will be conducted from engine to fuel pump to fuel, such as is the case with the mechanical fuel pump. Since the fuel pump was found to be a source of trouble in the temperatures previously given this source of heat, which caused the fuel to rise to a temperature near its boiling point, can be eliminated.

In addition, the electric fuel pump can be located at the fuel supply tank where it will work as a pusher of fuel rather than a puller of fuel and this has a great deal to do with boiling. The mechanical pump mounted at the engine is, of course, a puller. It draws fuel from the supply tank by creating a partial vacuum in the fuel lines behind the pump.

Pressure on any liquid has a great deal to do with boiling the same as temperature. If any liquid is put under pressure the boiling point is raised so that it can safely stand more heat before vaporizing. If an electric pump is located at the supply tank it operates as a puller, on vacuum, only for a short distance in drawing fuel from the tank into the adjacent pump. At this point the fuel is relatively cool and there is no danger of vapor lock. Between the fuel pump and the carburetor the fuel is pushed under pressure, which raises the boiling point. Vacuum or negative pressure lowers the boiling point. It is possible to vent the gas through an opening in the carburetor float bowl, but in so doing some of the fuel is wasted, perhaps as much as 10 per cent.

Vapor lock is more likely to occur in an aggravated form in the spring when the erratic weather makes it impossible for the refiner to outguess conditions 100 per cent. Sometimes on a warm day trucks will be operating on winter fuel, which has a greater tendency to vapor lock than does the fuel regularly supplied for warm weather operation.

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Chestnut and 56th Streets, PHILADELPHIA, PA.

Pot Shots at Valves

(Continued From Page 23)

briefly, consists of maintaining uniform and large water passages around the seat, guide boss carried well up and generously water cooled, and directed flow of water by utilization of distributing manifolds.

These things are just a few of the factors that the designers must consider. Now for some of the things that harass maintenance men.

In certain classes of operation, valve lubrication becomes of vital importance. There is a natural tendency to believe that oil should be kept away from the valve stems to prevent (first) too high oil consumption by sucking oil up past the intake stem, and (second) to prevent carbonization from taking place and causing sticking on the exhaust stem. However, if lubrication is very scanty, scuffing and actual seizure can occur which causes the valve operation to become faulty and set up leaky conditions in addition to rapid wear of the stem in the guide.

The type of operation is important. It has been found possible to completely ruin a set of exhaust valves in less than 1000 miles by operating under conditions where the oil can carbonize at the end of the guide and cause the valve to hang open slightly. It is not necessary to operate the engine with heavy loads to cause burning.

On the other hand, much improvement in valve stem life and lack of sticking has been noticeable where lubrication is sufficient to provide a good film between stem and guide. The odd cases would have to be considered and corrected individually rather than try to follow any general set rule.

THERE are several types of failures that, if studied carefully, indicate the basic cause. If burning and failure of the seat proper occur from the valve's inability to return to its seat, either due to insufficient clearance, slight sticking, etc., it is generally located in the seat proper and spreads over a considerable area.

Insufficient tappet clearance can cause a complete melting of the valve steel, but this always occurs right at the seat or through the seat proper.

Often the sticking of the valve can be determined by the fact that the valve head shows extreme local heating; that is the section around the burned-out portion will indicate it has been subjected to very high temperatures whereas a portion of it (as close as ½ in. away) will show no signs of corrosion or scaling.

Where the cylinder seat proper is assuming an egg-shape, even though it unseats the valve only a slight amount, fissures start in the seat proper and spread in both directions. The amount of burning depends upon how long the operation is continued after the leak started.

Cracks are generally caused by continued overheating of the head, setting up extremely high stresses since the temperatures throughout the head are not uniform. Under actual observation it is generally found that there is a black section near the outside diameter of the valve running into the red zone—this zone carrying down into the stem somewhat, naturally depending upon the

(Turn To Next Page, Please)

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(CONTINUED FROM PAGE 51)
characteristic design of the particular engine under observation.

FAILURES from breakage can be traced to several basic causes. Faulty seating made possible by any number of factors is one of the chief offenders. When the seating of the valve is such that it strikes on one side due to (first) out of squareness of cylinder seat with its guide, and (second) worn or tipped guide, etc., its velocity is quite high as in most cases the tappet face is still on the main portion of the cam, not having reached the low velocity ramp. The head has a tendency to tip with relation to the stem and since the stem section under the head is at a temperature where its strength is considerably reduced, bending occurs. When a new position is assumed this bend is in another direction and as the cycle repeats, the effect is analogous to any repeated bending fatigue test, and it is only a question of time before actual failure occurs.

Cracks, seams and in fact everything that can be a possible source of stress concentration are always possible causes for final failure. For these reasons it seems quite desirable to omit marking of the stressed portion by stamping numbers, etc., and it is becoming more and more general practice to omit the conventional screw-driver slot that is provided for grinding, using the suction cup or its equivalent where possible.

The relation of the guide length protruding from the guide boss appears to be in the same category as the valve seat width in that there is considerable variance of opinion on this subject as evidenced by the variety of designs.

There is no question but what the location of the guide boss proper has considerable influence on the operation of the valve, and the closer it can be carried to the seat the cooler the valve will operate. Careful comparison of a low and high location—with every factor unchanged other than raising the boss and, of course, providing cooling—showed a reduction in the valve temperature of about 200 deg. Fahr., a worthwhile gain as it was obtained without any sacrifice.

Where the boss is relatively low, it has been the practice to carry the guide up to act as a shield. In the majority of designs it is quite a detriment. Theoretically, it is supposed to shield the stem but actually it does nothing but get red hot, cooking any oil that happens to be in that vicinity and results in a stuck valve. Often it grows or warps out of shape and again sticking or hanging-open of the valve results.

COUNTERBORES simply prolong the time and do not accomplish the purpose for which they were provided. Sticking valve trouble from this source is generally hard to analyze as it is apt to occur at infrequent intervals and when checked by a competent observer, the trouble has disappeared. Engines operating under extreme conditions of load and speed are more prone to this type of failure than those that operate under more or less steady conditions. The practice of keeping the protrusion of the guide from the boss to a minimum length is in the majority of cases a good one to follow.

(TURN TO PAGE 54, PLEASE)

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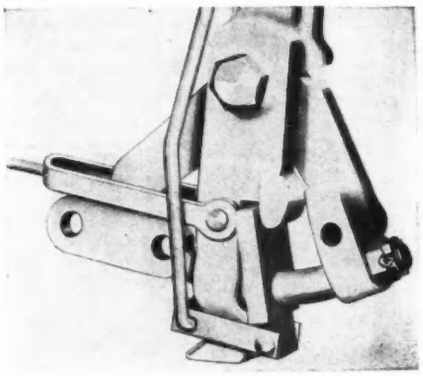

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Total mileage covered	3,022.2 miles
Payload weight	4,590 lb.
Gross weight	9,260 lb.
Average speed	31.04 m.p.h.
Total gasoline consumed	208.73 gallons
Miles per gallon of gasoline	14.48
Oil consumed	2.92 quarts
Total cost (gas, oil, lubrication)	$43.84
Total per ton-mile cost	$.00313

"THE THRIFT-CARRIERS FOR THE NATION"

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(Continued From Page 52)

The thought to provide more stem to guide clearance when sticking occurs is a tempting one and has resulted many times in engines operating with clearances far in excess of that actually required. The sticking is more than likely from some other source and increasing the clearance results in more difficulty since the guide loses its identity and cannot function in its proper manner, allowing the valve to float around more or less promiscuously, striking the seat at high velocity, uneven wear of the valve stem, etc., being the final result.

Attention to detail is important if valve difficulties are to be solved. This was brought out by a case of engine failure in which the tappet screw face had a poor finish. The surface which contacted the valves was poorly ground. After a short period of operation the tip of the valve stem wore sufficiently so that the clearance was excessive and the seating velocity increased to a value where valve failure occurred. The head of the valve lodged between the piston and cylinder, breaking the piston and connecting rod and the result was a complete engine failure traceable to a seemingly insignificant "detail."

Sheep Skins

(Continued From Page 27)

of its carburetors. This is the factory service school held in St. Louis and attended by shopmen, service attendants, fleet operators and mechanics from all over the world. The men are enrolled as employees, receive wages at shop rates and are expected to obey the rules of the company. They punch a clock and put in 40 hours each week at the school. The course lasts three weeks.

Just as at Harvard, Yale or Oxford, there is a waiting list of up and coming repairmen. You have to send in your application early and when notification of acceptance arrives, you go to St. Louis as best you can. Once there, you report to the registrar and receive your instructions and equipment. The company helps you find suitable lodgings near the factory, enters your name on the payroll and tells you when to report.

The first week of the course deals primarily with the fundamentals of carburetion. The class-room work is not merely lectures but includes working on carburetors themselves. Specially prepared note books facilitate the taking of notes and the students are given time to discuss their particular problems. Classes are kept small to make individual attention possible.

The second week is the working session. Men are given carburetors which have seen service in the field and they must rebuild them so that they will pass the same tests that are given new carburetors. If you fail to do this on the first attempt, you are given a second opportunity on the same unit. At the end of the second week each man is given an oral examination.

The third week does not deal with carburetors but covers the electrical end of tune-up. While this is not primarily carburetion, it is an important factor in it, and has much to

(Turn To Page 56, Please)

Whether you operate one truck or a fleet of trucks, you are interested in reducing your upkeep expense in every way possible.

Spongex Cushions are built to eliminate *unnecessary* cushion maintenance costs by doing away with frequent repairs and replacements.

There is no secret about the way in which Spongex Cushions reduce your cushion upkeep expense. There are no hard edges of metal to cause wear, no springs to collapse or break through the covering fabric, no hair to "mat down" or "bunch up"—just a deep, resilient construction of soft, bubbly, sponge rubber. Durable coverings are made more durable by lack of friction with metal parts. The filler will keep its live-rubber resiliency long beyond the life of the truck.

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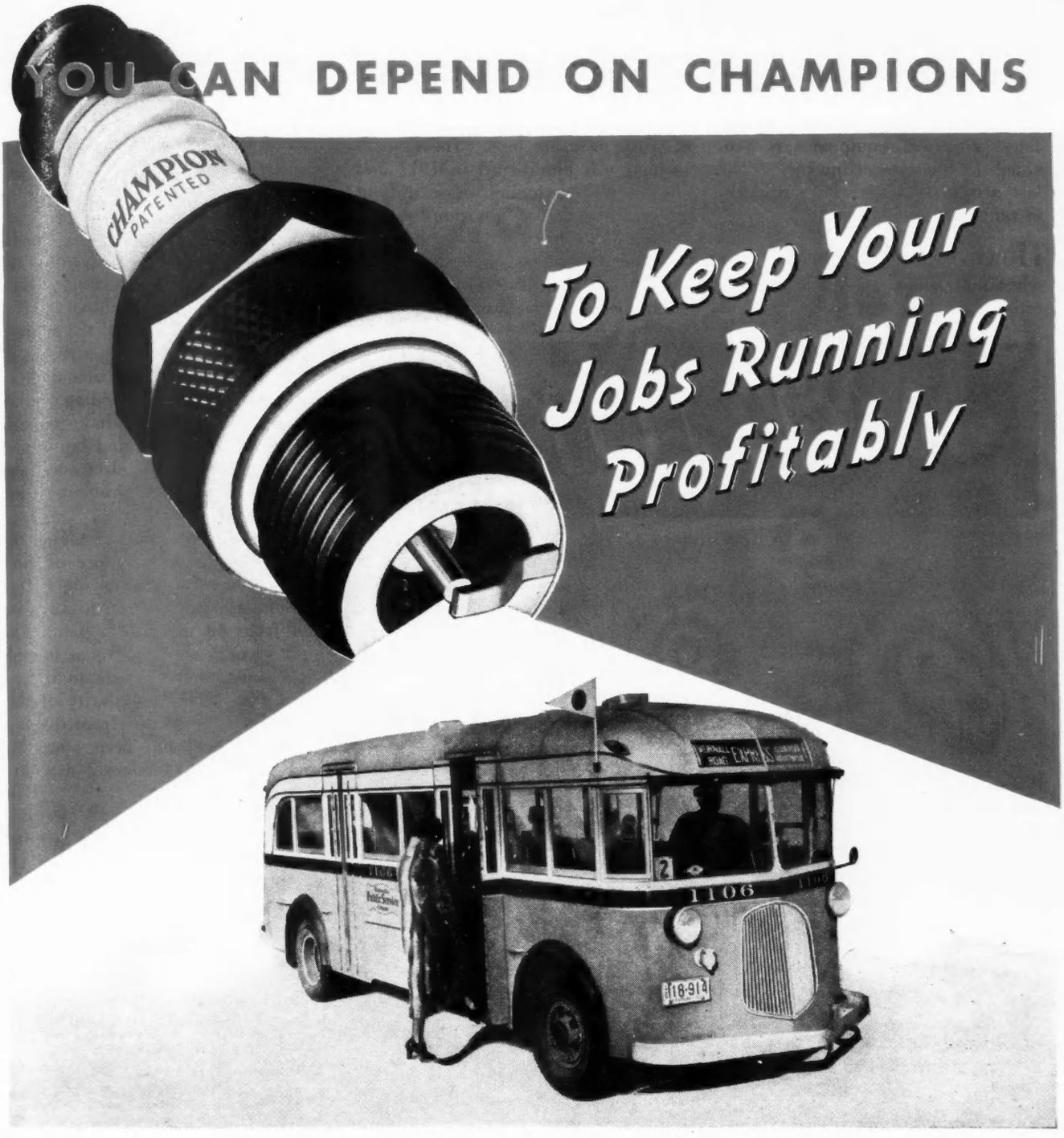

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That's why the majority of successful fleet operators, like the Kansas City Public Service Company, insist on Champion Spark Plugs. This company, in winning Bus Transportation's 1937 Gold Award for city companies, attributes a great portion of its success to the ability to "turn out jobs which stayed on the roads without failures or delays."

Champion Spark Plugs can make your operation more successful and more profitable. Replace old, worn-out spark plugs with new ones and they will increase the gas mileage of your fleet, step up their power and speed. Insist on *Champions* because you can depend on them.

THE SPARK PLUG CHAMPIONS USE

CHECK AND CLEAN SPARK PLUGS WHEN YOU CHANGE OIL

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(CONTINUED FROM PAGE 54)
do with carburetor failures. In this week you are taught to properly service all the electrical units on a vehicle. Modern test equipment from leading manufacturers is used and the latest electrical equipment is provided by equipment makers. The last two days of the week are spent in tuning automobiles.

HOWEVER, Carter is not the only school for shopmen with a grade A rating. The Lincoln Electric Co. of Cleveland is another one of those swanky houses of learning where some knowledge of the tools in hand are considered to be worth more than hit or miss methods in the bush. When you get through welding at Lincoln, you are tops. The Lincoln school was established in 1917 and has been functioning since without interruption. Its opportunities are available to fleet operators who realize the advantages of electric welding in maintenance of equipment and want their shop mechanics and maintenance men competently trained to handle any kind of welding job.

The welding course includes 120 hours of continuous work with the electric arc, is supplemented by demonstrations by the instructors and lasts four weeks. The students work in individual welding booths and have a welding machine for their exclusive use.

Beginning with the various fundamentals of practical arc welding, the course covers the following: study of the arc welding machine, its performance and control; the use of bare electrodes including striking an arc and running horizontal head without interruption, padding (building up plates and shafts); making butt welds, tee welds and lap welds; use of shielded arc electrodes and every other practical problem in arc welding.

If you are interested in taking the course, you have a choice of four sessions, two day and two night. Day sessions are from 6 a.m. to 12 noon and from 12 noon to 6 p.m. The night sessions are from 6 p.m. to midnight and from midnight to 6 a.m. Some idea of the popularity of this course may be gained from the fact that the school has been operating since 1917 for 24 hours a day, five days a week.

This training in electric welding is available to the mechanic at minimum cost. There is no charge for the instruction or use of company equipment. There is a charge of $10 to defray the cost of electric power and welding material used during the four weeks of training. The location of the school is convenient to lodging and rooms and meals may be secured at a very low rate.

At the close of the session each student receives a certificate certifying his competence as an arc welder. Fleet operators considering sending their mechanics to this school should notify the school two months in advance. There is always a waiting list.

IF it is not one thing in which you may want schooling, perhaps it is another—maybe in Diesel maintenance. If so, the Diesel manufacturers conduct schools to give you the low-down on the repair and maintenance of their equipment. Waukesha, for instance, has been conducting a school at its plant in Wau-

(TURN TO PAGE 58, PLEASE)

Warford

Warford Dual Axle Drive Multi-Wheeler Used for the Delivery of Fuel Oil. Tank Capacity, 1520 Gallons.

Customer Satisfaction is founded upon dependable transportation. The efficient quick handling of orders is what gives YOUR firm a Record of Reliability.

You can depend upon the WARFORD TEN-WHEELER to go anywhere, stop anywhere, for it has *Eight* Wheel Traction and *Ten* Wheel Braking. Your load will reach its destination safely, be road surfaces rough, smooth, soft, or slippery. The extra gear ratios of the WARFORD Super-Auxiliary Transmission keep ten ton loads well within the working limits of the Ford V8 engine.

Ask your Ford Dealer or nearest Warford Distributor to Show you how you can get improved highway transportation With Warford Ten Wheelers.

MORE TONS • MORE MILES • LESS COST

THE WARFORD CORPORATION
44 WHITEHALL STREET, NEW YORK, N. Y.

For Quick, Safe, Smooth Stops
Wagner CoMaX BRAKE LINING

Consider These CoMaX Features

CoMaX is available in sets, rolls and blocks, and every inch of this superior product possesses many features worthy of your consideration. For example:

NON-COMPRESSIBLE . . . Does not compress under pressure. Brakes lined with Wagner CoMaX run for long intervals without needing adjustment.

HOMOGENEOUS . . . Uniform texture throughout. As the lining wears, the same type of braking surface is always exposed to the drum.

WIRE BACKED . . . permitting deep seating of rivets—and increasing depth of lining available for braking service.

EASY ON DRUMS . . . Contains no abrasive material.

IDEAL FOR HIGH SPEEDS . . . No fade-out under high friction temperatures.

QUIET . . . Grips silently. No "howling" or "squealing."

SMOOTH . . . Permits even, controllable deceleration.

AGE-PROOF . . . Does not deteriorate in stock.

PRICED RIGHT . . . CoMaX sells at competitive prices notwithstanding its superior qualities.

COMPLETE COVERAGE . . . Available in sets, rolls and blocks—in all widths and thicknesses—for all makes of passenger cars, trucks, tractors, trailers, buses, etc.

WAREHOUSED NATIONALLY . . . Prompt delivery is assured because jobbers can draw from nearest 25 strategically located factory branches.

Clip and Mail Coupon for Details!

B38-1B
C. C. J.

AUTOMOTIVE PARTS DIVISION

Wagner Electric Corporation
6400 Plymouth Avenue, Saint Louis, U.S.A.

Send complete information on Wagner CoMaX.

Name_____

Address_____

City_____ State_____

My jobber is_____

(CONTINUED FROM PAGE 56)

kesha, Wis., for the past two or three years. Classes are limited to eight or 10 at a time and are open to Waukesha-Hesselman and Waukesha Ricardo Comet Diesel users, their service men and shop supervisors in the fleet operating field. The term lasts about 10 days and the men are given a thorough training in the repair and adjustment of Diesels. Courses are given at irregular periods and depend upon the frequency of application of students. There is no charge for this instruction.

Waukesha has even gone to college. That is to say, it cooperated with Nebraska, Minnesota, Iowa, Wisconsin, Purdue, Michigan and Ohio State colleges last winter in giving a course on Diesel maintenance. This invasion of the campus by Waukesha and other members of the Internal Combustion Engine Institute came as a result of requests from garage mechanics, fleet supervisors and operators for information on Diesel maintenance. The course ran for three to four weeks during February and for that purpose the manufacturers furnished traveling laboratories, service men and field lecturers. The total enrollees in the seven schools for the course was 252 and the average age was 31. The results were so satisfying that there is a likelihood that it will be repeated early in 1938. Shopmen who live in the vicinity of these universities will get a break.

The Buda Co., Harvey, Ill., also conducts a school in periods of about two weeks with about 10 men to a class. The course of instruction covers Buda Diesels, of course, with a preponderance of instruction regarding fuel pumps and nozzles. For further information see your nearest Buda dealer . . . Cummins, too, instructs users of its Diesel equipment. However, Cummins instructs dealers' mechanics who in turn instruct service men in fleet shops. The mechanic or the operator has to be a Diesel user to get into one of these exclusive schools.

IF you steer a bit uncertainly amid the problems of front end alignment, the road to Weaver will set you straight, as well as your front axle. The Weaver Mfg. Co., Springfield, Ill., holds classes in the laboratory garage near its factory at regular intervals. The size of the classes are limited to 10 or less so that students can get as much individual attention as they need. Even when mechanics express a desire to attend classes between sessions, they are given individual instruction.

For practical purposes, used cars are obtained from local dealers who have problems troubling them, or cars are picked up from local used car lots and from customer's jobs sent in by local dealers. These vehicles are corrected by students under the watchful eye of the instructor.

Typical routine of the Weaver alignment course consists of four hours of study of wheel alignment theory; four hours of study of the constructional details of various front end systems and the usual methods of correcting them; 12 hours in checking and diagnosing ailments of various front end difficulties; 16 to 40 hours (depending on the time the student has available) in correctional work and analysis of the difficulties. Students are given heavy

$5,000 IN CASH

"WHY GREY-ROCK IS THE

PRIZES

FIRST PRIZE . . . . . $1,000.00 CASH
SECOND PRIZE . . . . . 500.00 CASH
Third and Fourth Prizes . . . . . $100.00 Cash Each
Fifth, Sixth and Seventh Prizes . . . 50.00 Cash Each
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Next 75 Prizes
New Alden-Cowdrey Brakeometers (Value $12.50 Each)

Next 50 Prizes—$5.00 Cash Each

. . . and an Acknowledgment Prize to All Other Entries . . .

YOU CAN'T LOSE—NOTHING TO BUY—NO BOX TOPS

JUST WRITE 50 WORDS

READ THESE EASY RULES

1. Contest open in United States and Canada only to the Proprietors, Foremen and Mechanics in garages, repair shops, service stations, brake shops and car dealer establishments, and also the Foremen and Mechanics in fleet operators' shops.

2. In fifty words or less tell "why Grey-Rock is the Fastest-Growing Line."

3. Write clearly on any white paper or ask your Grey-Rock jobber for official entry blank with suggestions for winning. Judges will not be influenced by grammar, spelling, penmanship or fancy entries. It's what you say that counts.

4. Be sure to give your own name, your company's name and the address of the place you work. Also give your Grey-Rock jobber's name and the name of his salesman who calls on you.

5. Contest closes midnight, June 15, 1938.

6. Duplicate prizes will be awarded in case of a tie. Judges' decision is final. All entries become Grey-Rock property.

Grey-Rock

study assignments and surprise quizzes and there is no time for loafing.

Those who have taken this course to date have been shop mechanics, service managers and garage men. in the employ of fleet and service station operators. The course is free but the student must make his own provision for lodging for its duration.

Both Bear Mfg. Co., Rock Island, Ill., and Bendix Products Corp., South Bend, Ind., conduct similar schools for users of their equipment and maintain elaborate set-ups for such instruction. The men who take the Bendix courses are usually beginners in the service field and average about 23 years of age. Classes are held regularly and the date of each class may be obtained by writing to these companies.

ANOTHER very profitable course for shopmen and one which the operator should not overlook is a course in spray painting. With excellent instruction available at no cost to mechanic or operator, there is little call for a misinformed or poorly trained shopman turning out a poor job through incorrect use of spray equipment.

DeVilbiss, for instance, conducts a comprehensive course in the use of its spray equipment at its Toledo plant. The course is conducted by well qualified instructors. Students, upon enrolling, are taken through the manufacturing plant and given first hand information regarding the manufacture of the spray equipment. After this, oral and practical instructions are given relating to spray gun construction and design, adjustment, operation, servicing, care and cleaning. Next, material containers are studied and the student learns how this equipment is made and how it should be used. Hoses, air compressors and air transformers are also studied from the standpoint of construction, adjustment and use. The course also covers actual operation of spray equipment and all phases of its use. Practical tests are given in the operation and use of equipment in specific painting fields and the student must qualify in the repair of the equipment in the company's own repair department.

This training course is of one week's duration starting Monday and ending Friday. For the spring of 1938 training periods will open on Feb. 7, March 7, April 4, May 9 and June 6.

Although you don't have to matriculate the day you are born, DeVilbiss requires several weeks advance notice. There is no charge but you eat and sleep as best you can.

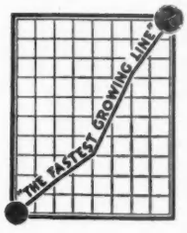
WHILE in Toledo, no aspiring shop man should miss the opportunity of a complete electrical training afforded by Electric Auto-Lite. It's free, last three weeks and like the other schools, is open to fleet men. But classes are limited to 12 members and so great is the school's popularity that reservations are now on the books well into the 1938 summer season.

Each new group is the guest of Auto-Lite at a get-together dinner on the first night of the course. Here movies of various Auto-Lite operations are shown. After that work starts with a vengeance. Each student is given a leather-bound note book and into it flows a continuous

(TURN TO NEXT PAGE, PLEASE)

AND PRIZES TELL US

FASTEST-GROWING LINE"



If you haven't already sent in your 50 words, do it now. You're certain to win a prize—and you may win $1,000.00!

Just tell the features that make Grey-Rock the fastest-growing line. Remember, Grey-Rock is not just a brand of brake blocks; it is a whole new commercial brake service plan. Starting with the simple combination of "2 blocks and the Guide," tell us how Grey-Rock balances brakes on everything from light delivery trucks to heavy 4-wheelers, 6-wheelers, and tractor-trailer trains. Grey-Rock Balanced Braking came after 250,000 actual field studies and eliminates guesswork in selecting the right lining for all conditions.

Mention the orange edges on Grey-Rock Blocks and the black edges on HiWaY BloX and why these markings make it easy to choose the correct materials. Remember the smooth, even stops that are kinder to drivers and brake drums. Remember how Grey-Rock helps you meet State and Federal regulations. Remember that Grey-Rock balanced brakes lead to safety with fast schedules.

Send your answer NOW to Grey-Rock, Dept. CCJ, Manheim, Penna.

UNITED STATES ASBESTOS DIVISION *of Raybestos-Manhattan, Inc.*, MANHEIM, PA.

BRAKE LININGS • CLUTCH FACINGS • FAN BELTS • HOSE • PACKINGS • RELINING EQUIPMENT

BALANCED BRAKE BLOCKS

(CONTINUED FROM PAGE 59)
procession of literature including copies of all lectures and subsequent bulletins that are released during and after the course.

Far more than Auto-Lite systems are taken up in the course, for thoroughly covered are such subjects as batteries, starting switches, horns, windshield wipers, spark plugs, automatic chokes and stop-light switches. To give the necessary shop-work experience, a model service station has been set up, complete with modern testing and servicing devices. Defective cars are brought to the shop and the student is required to locate and remedy the trouble. When he's through he knows not only what to do but why it's done.

FROM stationary service schools to service schools on wheels was just a minor matter to the Ford Motor Co. and now 88 such schools operating out of 36 Ford branches cover the country in an effort to bring Ford dealers, service stations and fleet operators the recommended procedures in servicing Ford trucks and cars. Upon request, the operator of the school will even conduct classes for independent garage men in his territory.

Last year more than 26,000 mechanics viewed the inside of a Ford's intestines under the tutorship of an experienced instructor. Classes last several days—and longer if a mechanic is taking the full course which includes engine repair, front end alignment and tune-up testing. To bring this school to your door you need only see your nearest Ford branch.

There may be and undoubtedly are other schools for service men conducted througout the country by equipment manufacturers but this was about all the cramming we could do for one term. Any further information will have to be supplied after school hours—which means some other time.

Don't let
VIBRATION
bring the Fleet in
TRANSPORTATION profits roll in only when the fleet rolls on . . . not when it rolls in for repairs. Vibration can quickly send it scuttling for the repair shop with broken fuel lines.
That's why truck builders use Weatherhead flexible fuel lines as original equipment. It's vibration proof and oil proof.
Play safe! Use Weatherhead for replacements and you'll put the fleet back on the road quicker and keep it there longer.
WEATHERHEAD
FLEXIBLE FUEL
LINES The safe line for replacements
WEATHERHEAD
300 E. 131 ST. CLEVELAND, OHIO

GM's New Diesels

(CONTINUED FROM PAGE 32)

lubricant capacities of the engines are 8½, 10½ and 15½ qt.

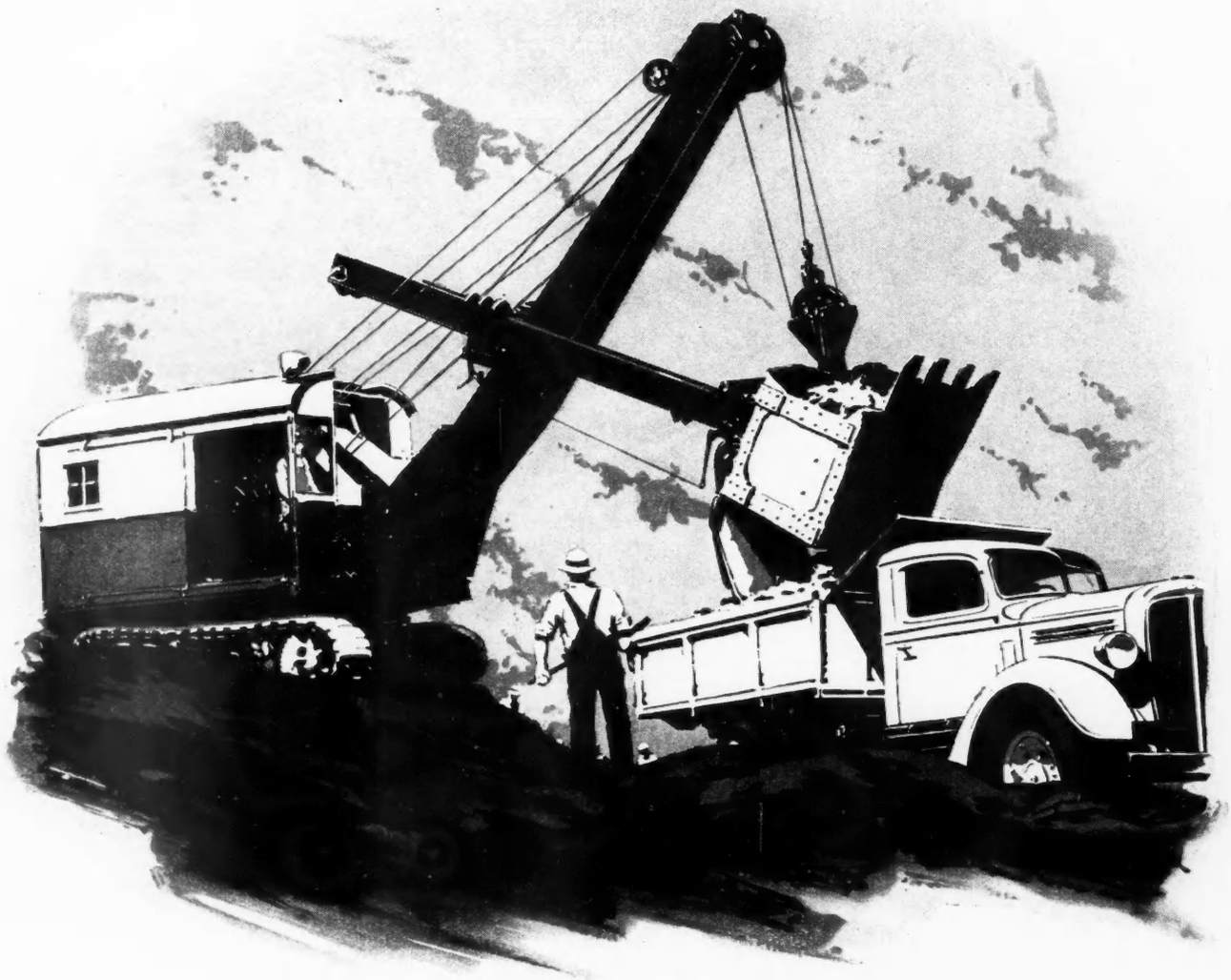
THE compression ratio for all engines is 16 to 1 and there are two exhaust valves per cylinder, 1 11/16 in. in diameter. There are four main bearings in the three-cylinder model; five in the four and seven in the six-cylinder. They are all 3½ in. in diameter and 1⅛ in. long. The crankshaft is hardened by the Tocco process. All crankpins are 2¾ in. in diameter and 1 25/32 in. long.

Cylinder heads are in a single casting and contain the dual exhaust valves and injector unit. Valves are operated through pushrods and rocker arms from a camshaft located in the upper part of the cylinder block and driven by the train of gears that also drive the supercharger.

The oil pan and valve covers are steel pressings. The supercharger, which has two three-lobed rotors, is flange-mounted on the side of the cylinder block and discharges air directly into the chamber which surround the cylinders.

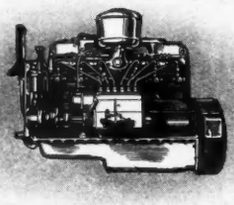
For complete description of the operation of the engines see page 32.

SMOOTHING THE PATH FOR TRAFFIC



For over twenty-two years the sole activity of Hercules has been to produce internal-combustion engines. Hercules has led the way in introducing new models and types of advanced engineering design, which have been an important factor in the progressive development of road building and contracting machinery as well as automotive, agricultural, marine, oil producing and industrial equipment. Today, as the world's largest engine builder specializing exclusively in the manufacture of internal-combustion engines—both gasoline and Diesel—Hercules welcomes opportunities to render further service to all manufacturers interested in heavy-duty power.

HERCULES ENGINES



HERCULES MOTORS CORPORATION, Canton, Ohio
Oil Field Sales and Service Branch, Kilgore, Texas

AMERICA'S FOREMOST ENGINE MANUFACTURER
Power Plants from 4 to 200 Horsepower

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Air Waves

(CONTINUED FROM PAGE 22)

sion in virtually every step. The fact: that there are more applications for permits than there are channels available. The motive: that all new channels made available by re-allocation or new technological developments shall be zealously guarded to the end that these channels may be used where they can best serve "in the public good."

The first question then which faces the truck operator interested in radio equipment for his fleet is: Will it serve to the public interest for his units to be so equipped? If he cannot prove that point, there is under present circumstances little likelihood that a permit will be granted. The law specifically provides that proof of both public interest and necessity must be shown by applicant to the end that the public shall receive maximum benefit. Thus there seems little hope for an over-the-road hauler to expect radio equipment to keep his units posted with the home office for purely commercial reasons such as routine contacts and pick-up instructions, even though the value of such an installation may be clearly proved on the accounting records.

On the other hand for the operator of various types of emergency vehicles, there are a great many more opportunities. Here the Commission studies the merits of the case carefully to determine to what extent the public interest can be served. Well known is the fact that virtually every municipal police organization can now obtain a license for one- or two-way radio.

Radio communication systems for fire departments is another development well under way in certain sections as a result of FCC sanction.

But even here the Commission sees to it that wherever possible the transmission of messages from the fire department is made over existing police facilities, thus keeping the number of licensees to a minimum and easing administrative problems. In a few instances licenses have been issued direct to fire departments but these cases have been where the municipality temporarily lacked a police department. It is reasonable to expect exceptions to this rule in large cities, and also that certain two-way equipment for use on fire chief cars in particular probably will be permitted.

IN the public utility field a few installations have been permitted on emergency vehicles where proof was clearly in evidence that the installation would be to the public good. These include the Detroit Edison Co., Southern California Edison Co., Los Angeles, the Central Hudson Gas & Electric Co., Poughkeepsie, and a few others. But the interpretation of just what is to the public good is closely defined. The proposed installation in any given case must serve the immediate purpose of supply communications where other types have been found inadequate. The "public good" is expected to be served further by the development of the radio art itself as well as by the increased service which radio will bring to the vehicles equipped.

Interesting in this respect is the case of the Brooklyn & Queens Transit Corp. which operates extensive trolley and bus routes in these boroughs. So sold was this company on the value of radio-equipping its emergency fleet that it had a large radio manufacturer make an extensive survey of its needs and outline the commercially practical equipment that would be most suitable. This company actually placed a conditional order for a large portion of the equipment recommended.

Although the then Federal Radio Commission's examiner reported favor-

(TURN TO PAGE 64, PLEASE)

ECONOMY

The extra economies afforded by the Eaton 2-Speed Axle will cut your transportation costs materially.

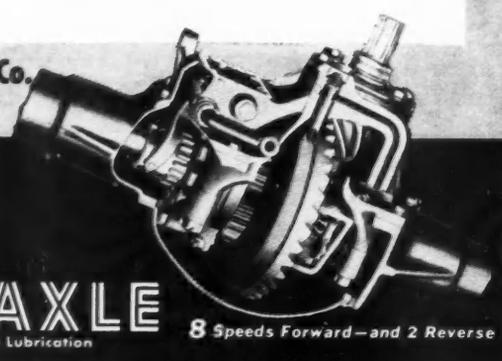
SAVES TIME through higher speed when returning light —faster climb of steep grades— quicker get-away in heavy traffic.

SAVES GAS by providing adequate power with correct gear ratio for every road and load condition. No engine racing.

SAVES OIL through reduced engine speed. Savings amount to as much as 31,000,000 revolutions and more per year.

SAVES REPAIRS to driving parts through elimination of bucking and frogging. Saves engine wear through lower engine speeds.

Eaton Manufacturing Co.
Cleveland, O.



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Ruckstell
2 SPEED AXLE
with New Eaton Forced Flow Axle Lubrication

8 Speeds Forward—and 2 Reverse

183 U.S. DAIRIES DELIVER ON TIME WITH SOVAC

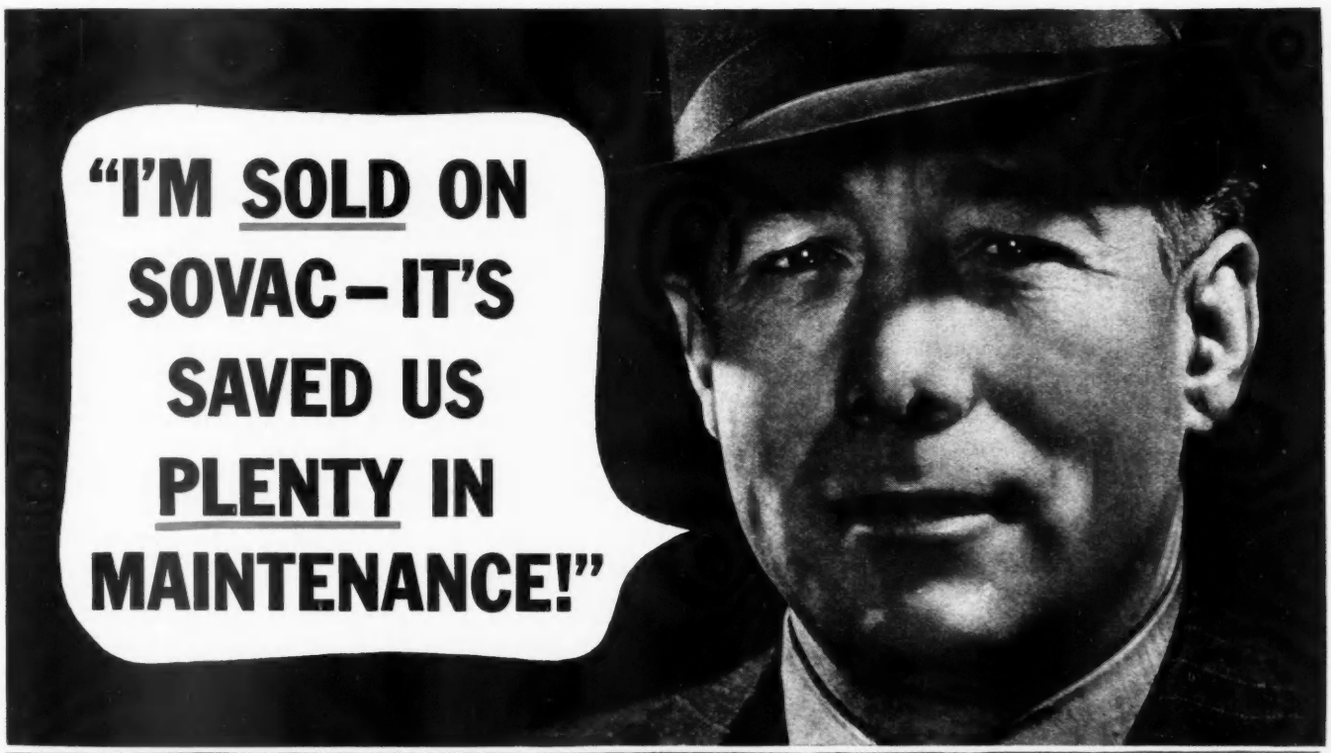
Enthusiastic Sovac Users Report Big Savings in Cutting Down "Repair Shop Layover"... Reducing Motor Wear... Getting More Mileage between Overhaul Jobs.

DOES YOUR fleet run on a stiff schedule? Do you want to cut down "repair shop time"? Then this fact will be of definite interest to you: thousands of fleet owners, all over America, have found Sovac *stands up best!* It keeps engines in shape...vehicles *on the road.* And, in the bargain, you save money on oil and gas... tear-downs, regrinds, big overhauls!

Other men with operating problems like your own have found Sovac cuts a big slice out of their bills. The Socony-Vacuum Fleet Engineer will gladly show you their testimony.

Better yet, he'll run a test on some of your own units. You can judge the results yourself... *see* how much Sovac will save you!

Why not write for the Fleet Engineer today?



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STANDARD OIL OF NEW YORK DIVISION · WHITE STAR DIVISION · LUBRITE DIVISION · MAGNOLIA PETROLEUM COMPANY
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(CONTINUED FROM PAGE 62)
ably on the set-up, when the case came up for hearing, it was promptly denied. The Commission stated:

"On consideration of the examiner's report, the evidence and argument of the counsel, the Commission is of the opinion:

"1. That the applicant has not shown evidence of preliminary experimental work or a program of proposed experimental work that would warrant the allocation of the facilities required;

"2. That the proposed radio activities of the applicant do not afford reasonable promise of contributing substantially to the development of the radio art;

"3. That the applicant has not shown that the public interest would be served by the operation of the proposed station; and

"4. That the public interest, convenience and/or necessity would not be served by the granting of the application."

On the other hand, both the states of Washington and Oregon have large snow removal fleets and these operations are equipped to considerable extent with two-way radio communications. It is important to note that these fleets are state owned and operated and their radio equipment is licensed as an integral part of the state radio police net-work. This can make a big difference in governmental thinking.

Another strong point that favored these two radio installations was the life-saving feature of the equipment, for a crew stranded in a mountain pass, where snow 20 feet deep is the rule rather than the exception, closely parallels the case of a ship in distress at sea— and ships incidentally come under a category never denied the radio privilege provided the vessel is above a specified minimum size.

IN between the Washington and Oregon fleets and the case of the BQT in New York, there are hundreds of other applicants seeking radio permits for their particular field. Some have been accepted, as in the case of certain public utility emergency fleets in the larger cities and a few smaller ones. But always the proof of emergency use must be convincing. More convincing is the case of a power line transmission company that operated special units along its power lines, often miles from the highways, maintained that radio equipment would be invaluable in contacting these units for quick line repairs, but was unable to convince the Commission that telephone service could not handle the needs as well as radio equipment.

Naturally one-way equipment for police work is, from the standpoint of availability of frequencies in the 2300-2500 kilocycle band, far more practical from a Commission point of view than is the two-way system. For the latter type means in effect that each mobile unit so equipped is in itself a portable broadcasting station creating potential radio interference over wide areas. For this reason, it is hardly conceivable that any operation, however important, would be permitted the use of portable transmitters in any but short-range operations, particularly in congested areas.

The question has been raised: "Why should the so-called 'Hams.' that vast army of amateur operators throughout the country be permitted the coveted radio licenses when commercially sound business installations are so flatly denied?"

The answer apparently lies in the fact that the 'Hams' who can be licensed to operate either fixed or mobile units, have made important contributions to the advancement of the radio art and are looked to as a possible source of future technical developments. Also, the government looks

(TURN TO PAGE 66, PLEASE)

An Exceptional Value!

HEIN-WERNER 7 TON CAPACITY HYDRAULIC JACK

7 Ton Models $11.75 WEST COAST $12.60

One of a complete line . . . all BUILT RIGHT and PRICED RIGHT

It will pay you to equip every truck and car in your fleet with a Hein-Werner Hydraulic Jack.

In addition to the 7 ton model (shown at left) this complete line includes the "Bullet" Model, 1½ ton capacity at $2.80 . . . Light Truck Special, 2 ton model, $3.70 . . . For light trucks, 3 ton models at $6.95 . . 5 ton models at $8.95 . . . For heavy trucks, buses and shop use—12 ton models, $17.50 . . . 20 ton models, $30.00—and for modern passenger cars, Light Model BUMPER-LIFT, $4.10 . . . Heavy Model, $5.45 . . . Above prices net to fleet operators, and slightly higher on West Coast.

Ask your jobber or write us for details

HEIN-WERNER MOTOR PARTS CORP.
Waukesha, Wisconsin

FEW MODELS ENGINEERED TO DO THE WORK OF MANY
HEIN-WERNER hydraulic JACKS

N-17 is for engines of 7- to 10-quart crankcase capacity.

N-16, identical to N-17 except in size, is for engines of less than 7-quart capacity.

The filter element in its metal container can be lifted and replaced without the use of tools.

PUROLATOR-PROTECTION keeps your oil clean . . . keeps expenses down

DIRT, dust, carbon, sludge, and tiny pieces of metal are bound to get in your motor oil. To avoid expensive repairs, make it a point to get these impurities *out!* Keep the motor healthy —by keeping the oil clean!

Engineers agree that Purolator does a magnificent job of protective cleaning. Make sure that *your* equipment includes Purolator. It's your *insurance* against dirty oil and the costly damage that so often follows.

* * *

The N-Type Purolator is specially built to do the cleaning job in the most economical way. With large capacity for dirt absorption, properly determined flow rate, and long element life, the N-Type Purolator keeps oil clean, clear, and effective longer... under all operating conditions. Motor Improvements, Inc., Newark, New Jersey.

PUROLATOR

The Oil Filter

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(CONTINUED FROM PAGE 64)
upon these amateurs as a definite value in secondary communications linking the entire country with their net-work. Their value has already been proved on the occasion of several floods and other widespread emergencies, and it is not likely that the Commission will deprive them of their license in favor of purely commercial operations.

Surely there is room for future debate on the merits of radio equipment for fleet use even in just such a purely commercial case as the over-the-road hauler. For any means that might be used to relieve traffic congestion on the highways, commercial or otherwise, would surely be of direct benefit in reducing the highway toll, might even come within the Communications Commission's famed interpretation of being for the "public good."

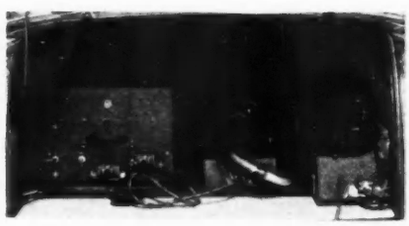
Perhaps there is here an opportunity for the Interstate Commerce Commission to show that its benefits to the trucking industry are not purely regulatory, by using its influence to prevail upon its fellow governmental body to permit the use of radio where it could be proved beneficial on the highway.

UP to now no particular mention of present-day radio cost or performance possibilities has been mentioned, in the belief that this information is considerably easier to ascertain than problems which have already been discussed. Naturally both cost and performance characteristics vary for different localities. However, as a brief guide, it may be stated that efficient 15-watt portable transmitters with a guaranteed range of from 5 to 15 miles and so small that they may fit easily into the trunk compartment of a passenger car, are now on the market complete with complementary receiving sets with a price range of $750 to $850. The price includes all equipment such as dynamotors for both receiving and transmitting sets, aerials, etc. The only added equipment recommended is an oversize generator to handle the 30-amp. draw of the transmitter (only when in use) and the normal full-time draw of the receiver.

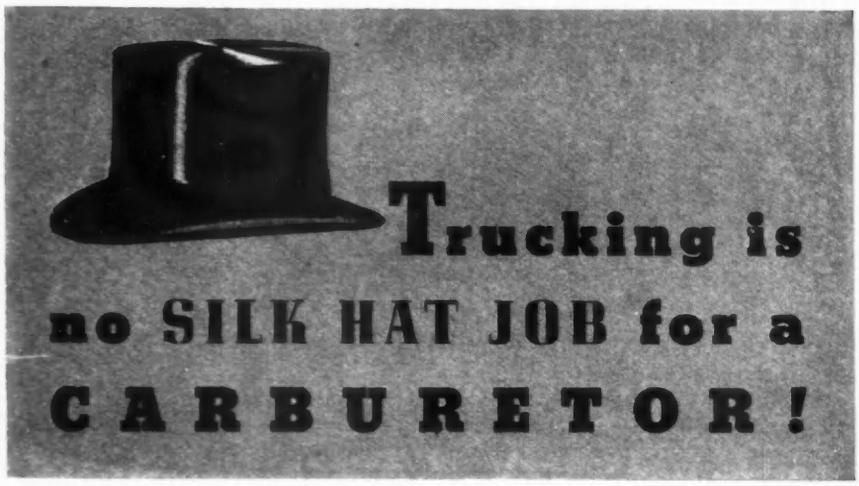
The fixed stations are usually larger and must operate under very definitely defined power limits. They vary from approximately $500 to $5,000. These have an effective range of from 15 to 35 miles. Most recent major technical improvement has been the development of ultra high frequency sets, many police units now operating in bands between 30,000 and 40,000 kilocycles.

As to what may be expected in the future, many developments are already making themselves apparent. This fall, the Commission announced plans for a complete revision of air-wave channel allotments to be completed by October 13, 1938. Channels now under the control of the Commission range from ten to 300,000 kilocycles and various bands have been set aside for broadcasting, experimental, relay, special services and television, etc.

But in spite of what the future may hold for radio, the Commission considers the constant demand for more police, more airplane and more marine equipment its most important look-out, and takes an ever stricter stand with regard to any radio operation where established wire service could answer the purpose as well.



Typical of modern two-way radio equipment is the compact RCA model shown. Left to right are: transmitter, transmitter dynamotor and receiver. Not shown is the smaller receiver power supply and the handset



ZENITH Carburetors are designed and built for the sort of job they're expected to do!

Qualities that make for stamina are inherent in every one of them.

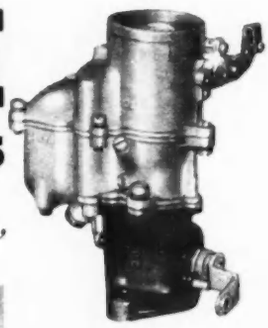
They're made to stand up under gruelling conditions—to take a beating every day and twice on Sundays.

That's why truck engineers specify Zenith as standard equipment on a great majority of their 1938 models. They know every Zenith Carburetor is ruggedly built. That it is economical, easy starting. And they know its efficiency extends throughout the whole driving range—from idling to open throttle.

And, of course, Zenith's power jet system assures full power without loss of economy.

Older model trucks will pull better, give you better gasoline mileage and better traffic performance after a Zenith installation. So try it. Yes—and install a Zenith heavy-duty Fuel Filter at the same time. It's 2½ times as efficient as the average 100 mesh screen filter. Quickly installed—cleaned in a few moments, requires no cartridge or packing renewal. Send coupon for complete details.

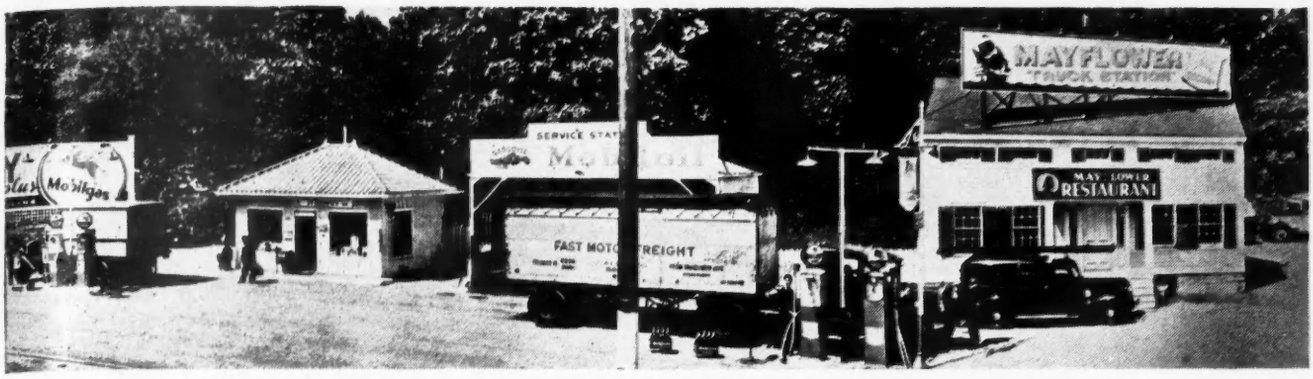
ZENITH
CARBURETORS
"Built for Permanence — Calibrated for Performance"



ZENITH CARBURETOR COMPANY
(Subsidiary of Bendix Aviation Corporation)
696 East Avenue, Detroit, Michigan

Send full particulars regarding Zenith Fuel Filters and Zenith Carburetors for following engines:

Make and model of vehicle .....
Name .....
Street Address .....
City ..... State .....
Nature of Business .....



Weary truck drivers can find real relaxation as well as contact with headquarters in the modern Mayflower Station hotel at Mianus, Conn.

Flag Stops for Truck Drivers

The first of a chain of service stations specializing in fleet trade has been opened by Mayflower Stations, Inc., at Mianus, Conn., 30 miles east of New York on the Boston Post Road. The unit features full service facilities and a complete modern hotel for truck drivers, including sleeping quarters, showers, recreation room and good food.

In addition, the Mayflower "signal service" will enable fleet operators to get in touch with their trucks promptly, anywhere within the area served by the stations. Signs bearing the operators' insignia will be distributed to each of the stations and when a truck is to be flagged, the insignia will be displayed in a prominent position. Mayflower's headquarters at White Plains will serve as clearing house for messages and will distribute them to its stations in Westchester County, New York, and in southern Connecticut.

Bee-Line School In Knoxville

The Bee-Line Co. has opened an Alignment School in Knoxville, Tenn. Anyone desiring to take the course which includes frame and axle straightening, may arrange for enrollment by addressing E. S. Stroberg, 407 N. Gay Street, Knoxville, Tenn., or the Bee-Line Co., Davenport, Iowa.

Manley Products Changes Name

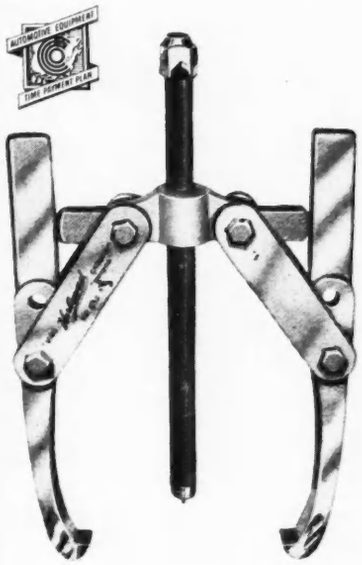
The name of Manley Products Corp., York, Pa., has been changed to The Remco Products Corp. There has been no change in management.

ANSWERS TO THE CCJ QUIZ

(See page 17)

1. Amber.
2. Ethylene Glycol.
3. Rowland Campbell.
4. Hydraulic valve lifters.
5. Diamond-T.
6. W. J. Frederick.
7. The power needed to move 1 pound, 33,000 ft. in 1 minute. Another way of putting it would be: the power needed to move 33,000 lb., 1 foot in 1 minute.
8. The odometer.
9. Decalcomania.
10. A.T.A. (American Trucking Associations).

GRAB THIS!



New HERBRAND "Van-Chrome" Heavy Duty GEAR PULLER

"You've got something there" is what we have been told by fleet operators who are using the new Herbrand No. 832 Heavy Duty Gear Puller.

This new tool is unsurpassed for pulling large gears, pulleys, wheels, bearings and other parts on trucks, tractors and heavy machinery.

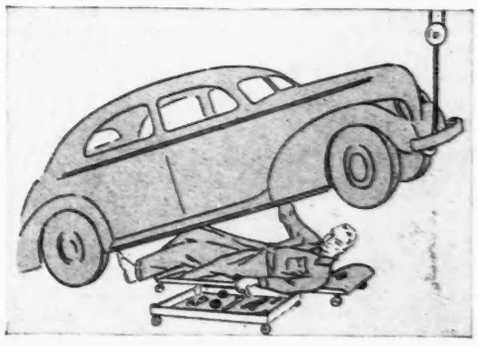
Patented jaws have gripping ability that definitely avoids slipping because jaws grip more positively as pull is increased . . . Capacity 12" . . . Size of screw ¾" by 13".

A COMPLETE LINE OF LABOR SAVING TOOLS

It will pay you to see your Herbrand jobber for any and all tools you may need. The Herbrand line is *complete*. It includes all sizes and types of end wrenches, socket wrenches, punches, chisels, screwdrivers, hammers, pliers, pullers, special time and labor saving tools, etc.

—and turn out better work with aid of this new HERBRAND ROLLER TRAY

This "mechanic's helper" No. MT-1 rolls under the car or truck. Helps mechanic keep from losing nuts, bolts, parts, etc. Also ideal for holding tools and parts within reach of mechanic who is working on underchassis. Rolls anywhere. Made of steel, size 18" x 18" x 13¾".



MAIL COUPON FOR 186 PAGE MANUAL . . . FREE

THE HERBRAND CORPORATION - Fremont, Ohio

Please mail Herbrand Tool Manual No. M-50 FREE to

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Firm Name .....

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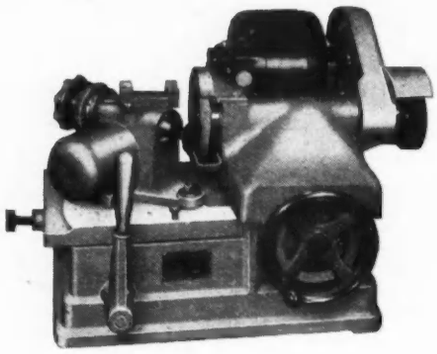
NEW PRODUCTS

(CONTINUED FROM PAGE 40)

Hall Valve Refacer

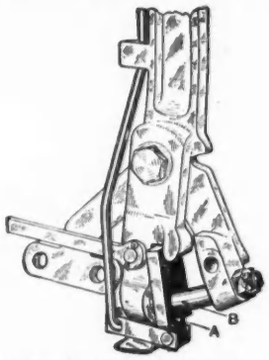
Hall Mfg. Co., P. O. Box 217, Station C. Toledo, Ohio., has introduced a precision dry type valve refacer, powered by two 110-volt motors. The work head has a ball-bearing spindle and is driven by worm and gear at a speed of 120 r.p.m. The work head is dowelled and is adjustable to all angles to 90 deg. A micrometer feed indicates the amount of metal being removed.



Hand Brake Assembly

Lockwood Automotive Products Co., 17 W. 60th St., New York, has a new hand brake assembly, which replaces the ratchet-and-pawl with a friction device operating on the lock-ring and bar principle. This gives a positive lock in any position of hand brake travel.

The braking strain is applied to the top of the locking-ring plate A, which is tilted and wedged, top and bottom, around the bar B. The harder the strain from the

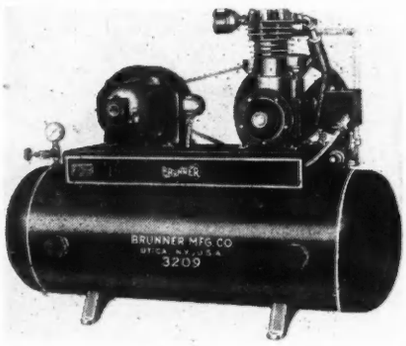


brake, the harder the locking ring is wedged around the bar and the tighter it holds. This wedging action can take place anywhere along the bar. There are no fixed locking positions. Malleable castings are used in the lever and other parts, and the ring-and-bar assembly itself is of cyanide-hardened steel.

Replacement models are being introduced for most popular models of trucks.

New Brunner Compressors

Two new economy air compressors are presented by Brunner Mfg. Co., Utica, N. Y. The 1½-hp. Brunner "3209" is a two-stage model, completely automatic, and maintains a steady air supply between 150 and 200 lb. Its displacement is 6.8 cu. ft.



The new ½-hp. Brunner "2012" is a compact, single-stage model designed for small garages. Completely automatic, it maintains pressure between 125 and 150 lb.

New Pressure Lubricator

The American Chain & Cable Co., York, Pa., announces a new lubricator known as the Acco-Morrow Pressure Lubricator. By building up pressure to 1000 lb.; and making an air-tight contact with any type of oil hole or fitting, this lubricator "flushes" out of old grit and dirt—bathes parts with fresh oil—and prevents wear.

(TURN TO PAGE 70, PLEASE)

YOU CAN LOWER COSTS HUNDREDS OF WAYS WITH THIS HANDY LINCOLN WELDER

A LARGE fleet repair shop in Cleveland, Ohio, reports that with their new Lincoln Welder they banish enough delays and save enough replacement costs to pay for their outfit over and over. Also, by having such an easy-to-operate welder handy, they can make many minor repairs which would otherwise develop into expensive repairs or replacements. The cracked body job illustrated is an example.

The versatility of this Lincoln Welder enables you to use it almost continually—doing work in half the normal time, at one-half or one-third the normal cost. Of motor-generator type, giving d. c. welding current, its field of application is exceptionally wide. With it you can repair broken parts, build up worn parts and fabricate frames, etc., of all sizes and types.

Mail the coupon for a bulletin giving valuable suggestions for the profitable use of arc welding in fleet repair shops.

Salient Facts
RANGE . . 45 to 200 amperes with reserve overload capacity.
SIZE . . . . Only 2 ft. sq.
WEIGHT - Only 437 lbs.
AND THE PRICE IS SURPRISINGLY LOW

THE LINCOLN ELECTRIC COMPANY
Largest Manufacturers of Arc Welding Equipment in the World

THE LINCOLN ELECTRIC COMPANY
Dept. AF-464, Cleveland, Ohio

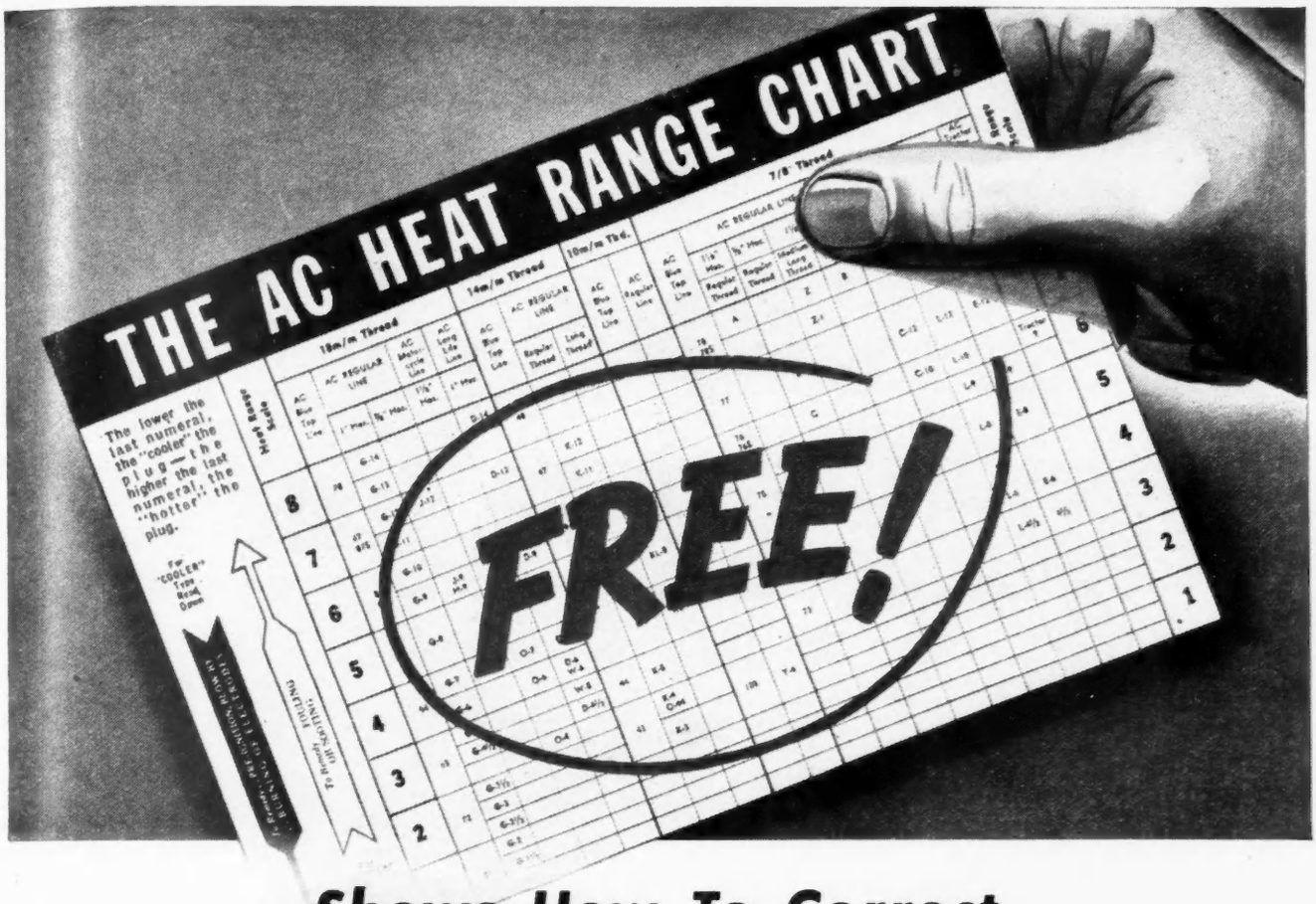
Send a free copy of ☐ the bulletin on Arc Welding in the Fleet Repair Shop. ☐ Bul. 314 and easy payment details on the Lincoln "SA-150" Welder.

Name _____ Position _____

Company _____

Address _____

City _____ State _____



Shows How To Correct

CHRONIC SOOTING AND BURNING

Will save you money on Plugs and Service

FOR PEAK PERFORMANCE

THE QUALITY SPARK PLUG

Thirty years' experience in manufacturing spark plugs for hundreds of manufacturers and millions of vehicles stands back of AC Spark Plugs.

Do you have trouble with chronic plug sooting? Do you have trouble with preignition, blow-by, rapid electrode burning, or chronic oxide coating? If you do, the AC Heat Range Chart will prove itself one of the most valuable "service tools" you ever had!

Correcting these troubles — regardless of the makes of plugs you use — is entirely a matter of finding the right *heat range.* That's all there is to it.

For instance, chronic sooting is a positive indication of a plug that runs too cool. On the other hand, chronic preignition or too rapid electrode wear are sure signs of a plug that runs too hot. The AC Heat Range Chart shows exactly how to pick a type a few steps hotter or cooler.

A plug of correct heat characteristics will last longer, give better fuel economy, need less service, AND CUT YOUR COSTS! So, if your AC supplier doesn't have an AC Heat Range Chart, send in the coupon below. No obligation, of course.

AC SPARK PLUG DIVISION • *General Motors Corporation* • FLINT, MICH.

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AC SPARK PLUG DIVISION
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Send me____ AC Heat Range Charts for our fleet of ____ vehicles.
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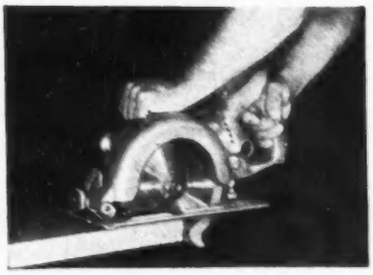
(CONTINUED FROM PAGE 68)

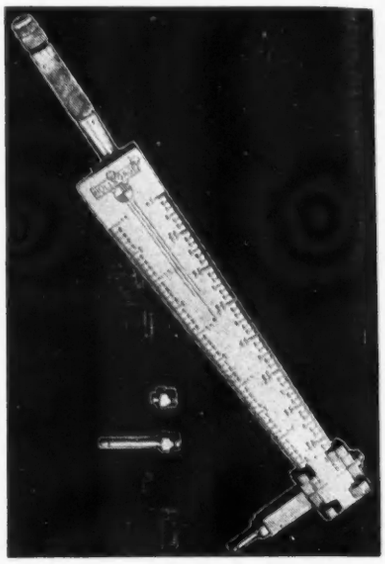


B & D Portable Saw

Black and Decker Mfg. Co., Towson, Md., have a new portable 7-in. electric saw. The depth of cut is adjustable to any depth up to maximum. The saw table may be adjusted to any angle from 0 deg. to 45 deg. for bevel cutting. Various types of blades and abrasive disks can be used on this saw.

Holls Cylinder Gage

Designed to enable any mechanic to determine the condition of cylinders from 2½ in. to 4 in. in diameter, with micrometer accuracy, the Holls Cylinder Gage has been introduced by the American Hammered Piston Ring division of Koppers Co., Baltimore, Md. The gage is a direct reading, precision tool having a tapered face on either side of which is a scale. One side

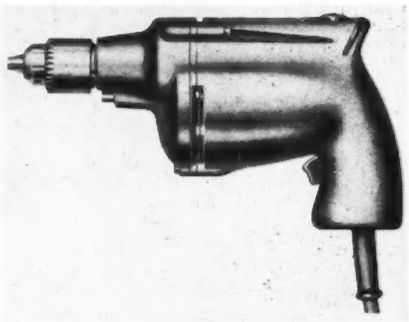


gives readings in thousandths of an inch and the other in sixty-fourths of an inch. A handle provides a means of adjusting the gage to the diameter of the cylinder at any given point. Thus, a reading of the diameter, accurate to .0005 of an inch, can be had.

The Holls Gage will be distributed through American Hammered jobbers, in connection with a merchandising plan whereby any shop can secure one without cost.

Van-O-Mite ¼-in. Drill

Van-O-Mite, a new extremely small ¼-in. electric drill, has been announced by the Van Norman Machine Tool Co., Springfield, Mass. It is 8 in. long, 2½ in. wide and weighs only 2½ lb. Can be supplied with 110- or 220-volt motor which maintains a full load speed of 875 r.p.m.



New Imperial Control

A new control, equipped with bakelite knob, for use in adjusting chokes, throttles, heater valves, vaporizers, etc., has been announced by The Imperial Brass Mfg. Co., 1200 W. Harrison Street, Chicago.

Three different colors of knobs can be supplied. A 66-in. length of 3/16-in. flexible tubing and 88-in. length of 1/16 in. wire make the control adaptable to all purposes.

(TURN TO PAGE 88, PLEASE)

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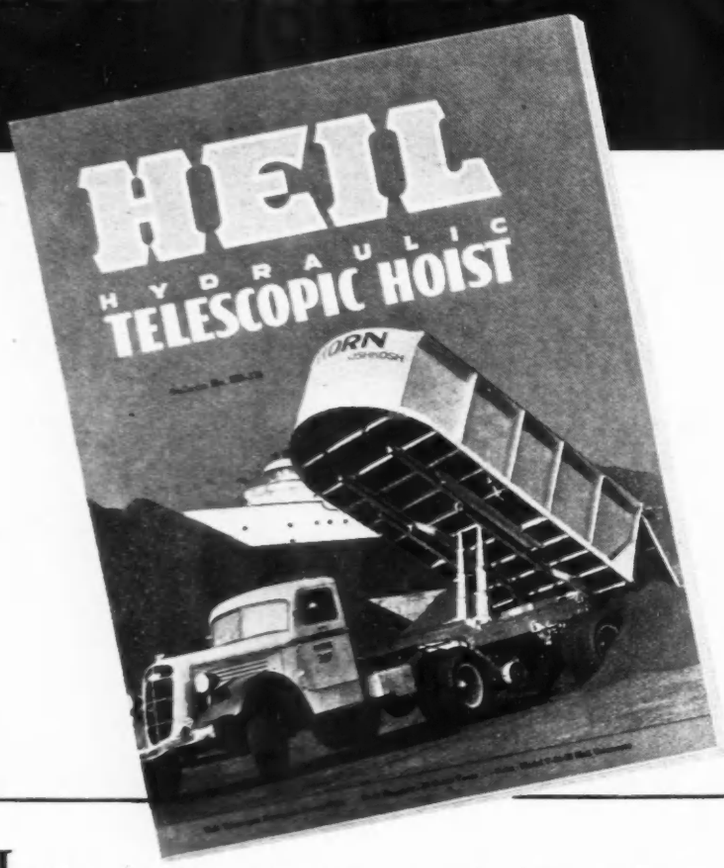

HERE is a new Heil catalog that every truck salesman and every user of heavy duty dump units will want for his reference file because it illustrates and describes Heil Straddle-mount Telescopic hoists, Heil twin telescopic hoists and various types of Heil large capacity dump bodies . . . Send today for your free copy of this new catalog and remember, whenever *you* are in the market for any kind of hydraulic dump units or transportation tanks *get Heil recommendations before you buy!* . . . . . Address:

MILWAUKEE, WISCONSIN **THE HEIL CO.** HILLSIDE, NEW JERSEY